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ANNUAL REPORT

OF THE

GEOLOGISTS' ASSOCIATION

FOR

1872,

TOGETHER WITH

LIST OF MEMBERS,

CATALOGUE OF THE LIBRARY,

LAWS OF THE ASSOCIATION, &c.

LONDON:
UNIVERSITY COLLEGE.

FEBRUARY, 1873.

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PAST PRESIDENTS.

TOULMIN SMITH, Esq.	1859
The Rev. THOMAS WILTSHIRE, M.A., F.G.S., &c.	1859
" " " " "	1860
" " " " "	1861
Professor JAMES TENNANT, F.G.S., F.R.G.S., &c.	1862
" " " "	1863
EDWARD CRESY, Esq.	1864
" "	1865
C. T. RICHARDSON, Esq., M.D.	1866
" " "	1867
Professor JOHN MORRIS, F.G.S.	1868
" " "	1869
" " "	1870
The Rev. THOMAS WILTSHIRE, M.A., F.G.S., &c.	1871
" " " "	1872

G. P. BACON, PRINTER, LEWES.

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REPORT

OF THE

GENERAL COMMITTEE

FOR 1872.

The General Committee have again the satisfaction of presenting to the Members of the Geologists' Association a Report recording great prosperity and progress.

The elections of new Members during the past year have been very numerous, and have added to your body several gentlemen well known as good and careful workers in Geological investigation.

Notwithstanding the greatly enlarged expenditure consequent upon extended operations, it will be observed from the Treasurer's Account that the income of the Association has more than correspondingly increased. Your Committee notice with great pleasure that a considerable sum has been received by the sale of publications, since it attests increased attention to the operations of the Association and interest in Geological science. The balance at the close of the year being very considerable, your Committee have decided upon the investment of the amount of the Life Compositions paid during the past two years.

The Papers presented to the Association, and read during the year 1872, were of more than usual importance, and were contributed, in some instances, by authors of

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eminence. Relating, as these communications do, to very various subjects and widely different localities, they cannot fail to prove of great educational value.

That which may be called the distinctive feature of the Geologists' Association—the organisation and conduct of educational Excursions or field meetings—formed last year a prominent portion of our proceedings. The greater number of the excursions were largely attended, and were evidently fully appreciated by those Members who shared in their advantages. The concluding excursion, extending over six days, distinguished the season of 1872; and you will be gratified to learn that the week's investigation of the Silurian and Cambrian rocks of Shropshire not only afforded valuable instruction to Members, but was followed by important scientific results. The high scientific character of the Excursions of the Geologists' Association will be at once apparent from the following list of Geological Formations observed and studied during the year 1872:—

POST GLACIAL—Aylesford, Crayford, Erith.
GLACIAL DRIFT—Finchley, Hendon, Watford.
RED CRAG—Walton-on-the-Naze.
BAGSHOT SANDS—Hampstead.
LONDON CLAY (Basement Bed)—Bushey.
WOOLWICH AND READING SERIES—Bromley, Bushey, Sundridge Park.
THANET SANDS—Erith.
CHALK—Chislehurst, Crayford, Erith, Guildford, Watford.
LOWER GREENSAND—Guildford, Maidstone.
GREAT OOLITE—Hampton Down, Bath.
INFERIOR OOLITE—Dundas, Somersetshire.
UPPER LIAS—Dundas.
MIDDLE LIAS—Dundas.
LOWER LIAS—Newbridge Hill, Weston, Twerton.
RHŒTIC SERIES—Newbridge Hill.
UPPER LUDLOW—Downton, Ludlow, Norton, Onibury.
LOWER LUDLOW—Evenhays, Leintwardine, Mocktree, Wigmore.
WENLOCK—Burrington.
LLANDOVERY—Longmynds.
CARADOC—Valley of the Onney.
LLANDEILO—Shelve.
CAMBRIAN—Longmynds.

Through the kindness of their respective owners and

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custodians, the following local and private Museums were inspected during the year 1872:—

The Charles Museum, Maidstone.
Mr. CALEB EVANS' Collection of London Clay Fossils.
The Museum of the Bath Royal Literary and Scientific Institution.
Mr. CHARLES MOORE'S Collection of Jurassic Fossils.
Mr. R. A. C. GODWIN-AUSTEN'S Collection of Cretaceous Fossils.
Dr. HENRY HICKS'S Collection of Cambrian and Silurian Fossils.
The Museum of the Ludlow Natural History Society.

Again your Committee have the pleasing duty of acknowledging great cordiality on the part of gentlemen possessing special knowledge of the districts visited, and they desire to record their high estimation of the services rendered to the Association by the Directors of the several excursions.

To the authorities of the British Museum, the Museum of Practical Geology, and the International Exhibition, the thanks of the Association are also due, and especially so to Professor Owen, Mr. Henry Woodward, Professor Morris, Professor Tennant, and Mr. Robert Daintree, F.G.S., who very kindly gave to the Members descriptive lectures.

Your Committee have also great pleasure in returning their warmest thanks for the hospitality most kindly and liberally offered during the excursions by the following gentlemen:—James Campbell, Esq., The Grove, Hendon; *Coles Child, Esq., F.G.S., The Palace, Bromley; R. A. C. Godwin-Austen, Esq., F.R.S., &c., Chilworth Manor; Jasper Moore, Esq., Linley Hall, Shropshire; and Humphrey Salway, Esq., The Cliff, Ludlow.

The regular and systematic publication of the Proceedings of the Association, commenced in 1871, has been attended with great success, and an entire volume has now been completed. This volume, containing the record of the operations of the Association during two years, will, it

* The recent death of Mr. Coles Child will be learnt by Members with great regret. Mr. Child's invitation to the Association to inspect the interesting sections on his estate, the warm interest taken by him in the excursion, and the assistance he rendered in obtaining facilities for the observation of everything of geological interest in the neighbourhood of Bromley, as well as his hospitable reception of the very large number of Members who took part in the excursion, sufficiently show that the Association has lost in Mr. Child a valuable friend.

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is confidently hoped, prove both instructive and interesting to the Members generally.

Considerable attention has been paid to the Library, and the privilege of borrowing books has been largely used. This increased interest in the Library is in some measure to be attributed to the new arrangement by which exchanges of books may be completed in the room in which your Ordinary Meetings are held. The large expenditure for the new book-case, to enable this arrangement to be carried out, has thus been amply justified by this gratifying result, as well as by the greater convenience it has been the means of affording to Members.

In order to allow of the Honorary Librarian attending the meetings of the Committee, and at the same time to facilitate the exchange of books, a Deputy Librarian has been appointed, and your Committee desire to express their best thanks to Mr. John A. Coombs for the zealous and efficient manner in which he has discharged the duties of this office.

The Rev. T. Wiltshire having occupied the Presidential Chair during two years, now retires. Your Committee are quite sure you will join with them in most cordially thanking that gentleman for his services as President.

The long connection of Mr. Wiltshire with the Association, of which he was one of the founders, and over which he presided during the first three years of its existence, as well as the great services he has at various times rendered, call upon your Committee to recommend Mr. Wiltshire, on his retirement from a second presidency, for election as an Honorary Member of the Geologists' Association.

As President for 1873, your Committee have great pleasure in recommending Henry Woodward, Esq., F.G.S., F.Z.S., of the British Museum. Mr. Woodward is so well known in the scientific world, both as an eminent palæontologist and as the Editor of the "Geological Magazine," and has rendered so many services to the Association, both by conducting excursions and by con-

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tributing valuable papers, that your Committee feel assured you will give to Mr. Woodward your very cordial support.

While offering again on your behalf the best thanks of the Association to the Council of University College for the continuance of the grant of the Library of the College for the Meetings of the Association, your Committee have great pleasure in adding their acknowledgments for the courteous compliance with the request that your new bookcase might be placed in that room.

The presentation by the Council of the Geological Society of the Greenough Geological Map is another very gratifying act of courtesy, and one which your Committee have peculiar pleasure in adverting to, since it is an assurance that the great Society to which all Geologists look with respect, fully recognises the value of our operations, and desires to afford that friendly aid which is as important to the one society as it is honourable to the other.

The great educational value of the Geologists' Association is strikingly shown by the number of Members who have, during the past year, been elected Fellows of the Geological Society. You will rejoice in thus finding that your Association is now effectively carrying out the object for which it was founded, and by stimulating the desire for, and by imparting a very considerable amount of Geological information, the Geologists' Association is aiding, in no small degree, in the diffusion of scientific knowledge.

The following Papers were read during the year 1872:—

On the Overlapping of several Geological Formations on the North Wales Border, by D. C. DAVIES, Esq.

Report of the Proceedings of the Geological Section of the British Association at Edinburgh, 1871, by JOHN HOPKINSON, Esq., F.G.S., F.R.M.S.

On the Occurrence of Peat in the Neighbourhood of Finchley, by JAMES T. B. IVES, Esq.

On the Chloritic Marl or Upper Greensand of the Neighbourhood of Cambridge, by the Rev. T. G. BONNEY, M.A., F.G.S., &c.

On the Geology of Hampstead, Middlesex, by CALEB EVANS, Esq., F.G.S.

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On a Recently Exposed Section at Battersea, by JOHN A. COOMBS, Esq.

On the Excavations on the Site of the Law Courts, by WILFRID H. HUDLESTON, Esq., M.A., F.G.S., &c., and F. G. H. PRICE, Esq., M.A.I., F.R.G.S., &c.

On a Visit to the Diamond Fields of South Africa, with Notices of Geological Phenomena by the Wayside, by JOHN PATERSON, Esq., M.A.

On Columnar Basalts, by JOHN CURRY, Esq.

On the Silurian Rocks of the English Lake District, by Professor ALLEYNE NICHOLSON, M.D., D. Sc., M.A., F.R.S.E., &c.

On Corbicula (Cyrena) fluminalis, its Associates, and Distribution in Britain, by ALFRED BELL, Esq.

On the Influence of Geological Reasoning on Other Branches of Knowledge, by HYDE CLARKE, Esq., D.C.L., F.S.S., M.A.I., &c.

On Coal Seams in the Permian at Ifton, Shropshire, by D. C. DAVIES, Esq., F.G.S.

On a Well Section at Finchley, by CALEB EVANS, Esq., F.G.S.

The following is a list of the Excursions of the past year:—

	Directors.
Visit to the Museum of Practical Geology, March 21st.	Professor Morris, F.G.S.
Excursion to Maidstone, April 2nd.	Prof. T. Rupert Jones, F.G.S. Prof. Tennant, F.G.S. W. H. Bensted, Esq.
Excursion to Watford and Bushey, April 13th.	William Whitaker, Esq., B.A., F.G.S. John Hopkinson, Esq., F.G.S.
Excursion to Hampstead, April 27th.	Caleb Evans, Esq., F.G.S. S. R. Pattison, Esq., F.G.S.
Excursion to Erith and Crayford, May 4th.	J. Logan Lobley, Esq., F.G.S.
Visit to the British Museum, May 11th.	Professor Owen, F.R.S. Henry Woodward, Esq., F.G.S., F.Z.S.
Excursion to Bath, May 20th and 21st.	Charles Moore, Esq., F.G.S. Rev. H. H. Winwood, M.A., F.G.S.
Excursion to Guildford, June 1st.	Prof. T. Rupert Jones, F.R.S., F.G.S. C. J. A. Meÿer, Esq., F.G.S.
Excursion to Bromley and Chislehurst, June 15th.	Coles Child, Esq., F.G.S. James W. Ilott, Esq.
Excursion to Hendon and Finchley.	Dr. Henry Hicks, F.G.S.
Excursion to Walton-on-the-Naze, July 8th.	J. Logan Lobley, Esq., F.G.S.
Visit to the International Exhibition, July 13th.	Prof. Tennant, F.G.S. Robert Daintrée, Esq., F.G.S.
Excursion to Ludlow and the Longmynds, July 22nd to 27th.	Prof. Morris, F.G.S. Rev. J. D. La Touche, B.A. Robert Lightbody, Esq., F.G.S.

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Your Committee beg to recommend the following list of Officers for 1873:—

PRESIDENT.

Henry Woodward, Esq., F.G.S., F.Z.S.

VICE-PRESIDENTS.

Robert Etheridge, Esq., F.R.S., F.R.S.E., F.G.S.
Pr fessor John Morris, F.G.S.
James Thorne, Esq., F.S.A.
Rev. Thomas Wiltshire, M.A., F.L.S., F.G.S., F.R.A.S.

TREASURER.

William Hislop, Esq., F.L.S., F.R.A.S., &c.

GENERAL COMMITTEE.

John Cumming, Esq., F.G.S.
John Hopkinson, Esq., F.G.S., F.R.M.S.
Wilfred Hudleston Hudleston, Esq., M.A., F.G.S., F.C.S.
James William Ilott, Esq.
M. Hawkins Johnson, Esq., F.G.S.
W. H. Leighton, Esq., F.G.S.
Thomas Lovick, Esq.
Charles J. A. Meÿer, Esq., F.G.S.
John S. Phené, Esq., F.S.A., F.G.S., F.R.G.S., F.R.I.B.A.
George Potter, Esq., F.R.M.S.
Professor Tennant, F.G.S., F.R.G.S.
Henry Walker, Esq., F.G.S.

HONORARY SECRETARY.

J. Logan Lobley, F.G.S., F.R.G.S.

HONORARY LIBRARIAN.

Arthur Bott, Esq., F.G.S.

(The Treasurer's Account is on the next page.)

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BALANCE SHEET OF RECEIPTS AND DISBURSEMENTS

For the Year ending December 31st, 1872.

Dr.

	£	s.	d.
By Balance, January 1st, 1872	102	17	11½
,, Annual Subscriptions and Entrance Fees ...	127	10	0
,, Life Compositions	36	15	0
,, Sale of Publications	7	9	0
,, Interest on Stock (Consold. 3 per cents. £126 16s. 4d.)	3	16	0
	£278	7	11½

Cr.

	£	s.	d.
To Printing "Proceedings" and Annual Report	86	6	2½
,, Miscellaneous Printing	11	4	3½
,, Bookbinding	1	12	6
,, Purchase of Books for Library	3	4	6
,, Cost of Bookcase for Library	20	6	0
,, Subscription to Palæontographical Society (1871 and 1872)	2	2	0
,, Gas and Attendance	7	2	6
,, Collector's Commission	0	18	9
,, Postage, Stationery, Porterage, Advertising, &c.	23	9	11
Balance	122	1	3½
	£278	7	11½

We have this day examined the Accounts of the Treasurer of the Geologists' Association, and find that a Balance of £122 1s. 3½d. remained in his hands on the 31st December, 1872.

(Signed) J. FOULERTON, M.D., J. SLADE, } *Auditors.*

January 24th, 1873.

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LIST OF MEMBERS.

CATALOGUE OF THE LIBRARY.

LAWS OF THE ASSOCIATION, &c.,

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HONORARY MEMBERS.

Year of Election.

1862. The Rev. DAVID HONEYMAN, D.C.L., F.G.S., &c., Antigonish, Nova Scotia.

1862. Sir WILLIAM EDMOND LOGAN, LL.D., F.R.S., F.G.S., Montreal, Canada.

1862. Dr. HERMANN WEDDING.

1867. JOHN MORRIS, F.G.S., &c., Goldsmid Professor of Geology and Mineralogy, University College, London.

1870. Dr. CHARLES CARTER BLAKE, F.G.S.

1870. WILLIAM CARRUTHERS, F.R.S., F.L.S., F.G.S., British Museum.

1870. B. WATERHOUSE HAWKINS, F.L.S., F.G.S., New York.

1870. THOMAS RUPERT JONES, F.G.S., Professor of Geology, Royal Military College, Sandhurst.

1871. THOMAS DAVIDSON, F.R.S., F.G.S., &c., Vice-President of the Palæontographical Society.

1871. CHARLES MOORE, F.G.S., &c., Bath.

1872. ROBERT ETHERIDGE, F.R.S., F.R.S.E., F.G.S., Palæontologist to the Geological Survey of Great Britain.

1872. JOHN PHILLIPS, M.A., LL.D., F.R S., F.G.S., &c., Professor of Geology in the University of Oxford.

1873. The Rev. THOMAS WILTSHIRE, M.A., F.L.S., F.G.S., F.R.A.S., &c.

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ORDINARY MEMBERS.

Names having * prefixed are those of Life Members, who have compounded for their Annual Subscriptions.

Names having † prefixed are those of Country Members elected previous to January, 1863, and who pay an Annual Subscription of Five Shillings only.

Year of Election.

1872. Abraham, Phineas S., B.A., B.Sc. New Oxford and Cambridge Club, 12, Grafton Street, W.
1862. *Adam, Thomas, Cliff House, Lytham, Lancashire.
1859. *Adams, William, F.G.S., &c., 5, Crockherb Town, Cardiff.
1872. Amey, Thomas, Petersfield, Hants.
1872. Angell, Arthur, jun., Guildford, Surrey.
1871. Atkinson, James, Honor Oak Hill, S.E.
1871. Avery, John Gould, M.A.I., 40, Belsize Park, N.W.

1859. Badcock, P., 4, Aldridge Road Villas, Westbourne Park, W.
1858. Badger, W., 4, Gutter Lane, Cheapside, E.C.
1861. Bailey, John W., 75, Broke Road, Dalston, N.E.
1871. Baldwin, Arthur Ernest, Avenue House, Berkeley, Gloucestershire.
1871. Barber, John, 52, Chepstow Villas, Bayswater, W.
1871. Bartlett, William, F.R.C.S., Ladbroke Lodge, Notting Hill, W.
1860. Bartlett, W. H., 4, Great George Street, Westminster, S.W.
1860. †Barugh, Lieut. J., Charlestown, Bridlington, Yorkshire.
1861. Bass, John Holmes, F.G.S., 2, Picton Villas, Camden Road, N.W.
1859. Bathurst, A., B.C.L., 2, New Square, Lincoln's Inn, W.C.
1871. Beale, W. Phipson, F.G.S., F.C.S., 27, Victoria Street, S.W.
1858. †Beckett, Henry, F.G.S., 1, Spring Hill Terrace, Penn Fields, Wolverhampton.
1870. Bedwell, F. A., 3, Old Square, Lincoln's Inn, W.C.
1871. Beesley, Thomas, F.C.S., 5, High Street, Banbury.

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1872. Bell, Alfred, 5, Upper Grafton Street, Fitzroy Square, W.
1858. †Bentley, J., Midland Bank, Peterborough.
1870. Blakesley, T. H., 10, Grays Inn Square, W.C.
1871. Blumberg, George, Mansfield House, Clifton Gardens, Maida Vale, W.
1871. Bonney, Rev. T. George, M.A., F.G.S., F.S.A., Fellow of St. John's College, Cambridge, Cambridge.
1862. Bonsor, Samuel, 433, Oxford Street, W.
1858. Bott, Arthur, F.G.S., A.A., *Honorary Librarian*, 227, Southampton Street, S.E.
1858. †Bower, Rev. Edward, M.A., Closworth, Sherborne, Dorset.
1860. †Bower, H. S., Shroton House, Blandford.
1871. Bowie, Mrs. A. A. L., 43, Palace Gardens Terrace, W.
1869. Braby, Frederick, F.G.S., F.C.S., Mount Henley, Sydenham Hill, S.E.
1867. Bradford, John, Long Room, Custom House, E.C.
1872. *Brady, Sir Antonio, J.P., F.G.S., Maryland Point, Stratford, Essex.
1860. Brain, Thomas, 1, Upper Vernon Street, E.C.
1858. Broadbridge, J., 1, Stanhope Terrace, Kensington, W.
1869. Browne, Colvile, Royal Agricultural College, Cirencester.
1859. Browne, Rev. T. H., F.G.S., High Wycombe, Bucks.
1871. Buckman, Professor James, F.L.S., F.G.S., Bradford Abbas, Sherborne, Dorset.
1871. Busby, Ralph Augustus, 3, Clifton Terrace, Clifton Road, Maida Vale, W.

1872. Campbell, James, The Grove, Hendon, N.W.
1870. Campbell, W. D., Boxgrove Road, Guildford, Surrey.
1871. Cattley, Mrs. Elizabeth, 34, Woburn Square, W.C.
1872. Chapple, William, Birkbeck School, Peckham, S.E.
1872. Cheesman, W. Norwood, 11, Vere Street, W.
1871. Clark, Robert, F.R.G.S., 46, Chepstow Villas, Bayswater, W.
1858. *Clarke, Hyde, D.C.L., &c., 32, St. George's Square, S.W.
1871. Clarkson, Frank, F.G.S., 1, Squire's Mount, Hampstead, N.W.
1863. *Clement, J. H., F.G.S.
1871. Coape, Lieut.-Col. Capel, Union Club, Charing Cross, W.
1872. Cooke, George E., 20, Osnaburg Street, N.W.

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1869. Coombs, John A., London Gas Works, Nine Elms, S.W.
1859. Cooper, Edmund, Temple House, East Ham.
1861. Cooper, George, Croydon, Surrey, S.
1871. Corfield, Professor W. Henry, M.A., M.B., F.G.S., F.C.S. &c., Fellow of Pembroke College, Oxford, 10, Bolton Row, Mayfair, W.
1861. *Cornthwaite, Rev. T., M.A., Walthamstow, N.E.
1865. Creswick, J. Frost, 13, Pelham Place, Brompton, S.W.
1867. Crombie, Rev. James, M.A., F.L.S., F.G.S., Newcomen Road, Finchley, N.W.
1858. Crowley, Alfred, B.A., &c., Bramley Oaks, Croydon, Surrey, S.
1859. Cumming, John, C.E., F.G.S., 7, Montague Place, Russell Square, W.C.
1859. †Curry, J., Boltsbourne, Eastgate, Darlington.
1858. †Curtis, W., Alton, Hampshire.

1859. †Dale, G., South Street, Chichester.
1873. Davies, Rev. Ebenezer, 17, Thornhill Crescent, Islington, N.
1858. Deane, Henry, F.L.S., F.R.M.S., 17, Pavement, Clapham Common, S.
1866. Deane, Henry, Junr., Clapham, Surrey, S.
1869. De Blaquiere, Lord, Springfield, Crawley, Sussex.
1867. Dessé, Ethelrid, M.D., F.C.S., &c., 43, Kensington Gardens Square, Bayswater, W.
1871. Dewick, Rev. E. S., M.A., The College, Eastbourne, Sussex.
1862. Dibley, G., Junr., 25, King Henry's Road, Adelaide Road, N.W.
1867. Doble, Edmund Mohun, 12, Mount Ararat Villas, Richmond, Surrey, S.
1871. Donagan, Miss, Handel House, Haverstock Hill, N.W.
1872. *Dovaston, John, Nursery, West Felton, Shrewsbury.
1858. †Dowker, George, F.G.S., Stourmouth House, Wingham, Kent.
1872. Duck, William Alfred, 4, High Street, Vauxhall Cross, S.E.
1864. Dunk, William, 105, Charlotte Street, Fitzroy Square, W.

1861. Elliott, J. H., 4, Martin's Lane, Cannon Street, E.C.

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1859. Elt, C. H., 1, Noel Street, Islington, N
1871. Elwes, John William, Park Lodge, Southsea.
1872. English, Henry, Woodstone, Peterborough.
1859. Evans, Caleb, F.G.S., 3, Downshire Hill, Hampstead, N.W.

1871. Fisher, Rev. Osmond, M.A., F.G.S., late Fellow and Tutor of Jesus College, Cambridge, Harlton Rectory, Cambridge.
1871. Forbes, J. E. Stuart, 48, Russell Road, Kensington, W.
1872. Fordham, H. George, University Hall, Gordon Square, W.C.
1871. Foulerton, John, M.D., F.R.S.E., &c., Thatched House Club, St. James's, S.W.
1861. Fox, H. Elliott, Court of Probate, Doctors' Commons, E.C.
1861. *Freeland, Parker William, 65, Elsham Road, Holland Road, Kensington, W.
1866. Fry, G. F., 3, Tavistock Street, Covent Garden, W.C.
1858. Furnivall, Frederick James, M.A., &c., 3, St. George's Square, Primrose Hill, N.W.

1871. Gardner, Henry Dent, 20, Notting Hill Square, W.
1864. Gardner, John, F.G.S., Park House, St. John's Wood Park, N.W.
1871. Gaskill, Roger, B.A., North Hill, Highgate, N.
1870. Gibbs, W. B., 5, Rock Terrace, Talfourd Road, Peckham, S.E.
1872. Gillett, Alfred, Uplands, Godalming, Surrey.
1866. Glasier, William Richard Minter, 5, Grote's Buildings, Blackheath, S.E.
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„ the Straits of Dover . .	W. Topley.
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„ Society, Abstracts of Proceedings.	
„ „ Address to, 1862 .	T. H. Huxley.
Glasgow Geological Society Transactions	
Graptolites of the Coniston Flags . .	H. A. Nicholson.
Halifax Literary and Philosophical Society,	Annual Report, 1866.
„ „ „ „	Proceedings, 1867.
Inaugural Lectures at the School of Mines—	
Inaugural Discourse	Sir H. De la Beche.
On the Educational Uses of Museums .	E. Forbes.
On the Importance of Special Scientific Knowledge	J. Percy.
On Habits of Observation . . .	R. Hunt.
Industrial Instruction on the Continent .	Lyon Playfair.
On the Science of Geology . . .	A. C. Ramsay.
On the Value of an Extended Knowledge of Mineralogy	W. W. Smyth.
Inferior Oolite and Lias of Northamptonshire	P. B. Brodie.
Invertebrate Fossils of North America.	
Knowledge a Condition of Success . .	Leoni Levi.
Leçon d'Ouverture à l'Ecole Polytechnique Federale	J. Marcou.
Leeds Philosophical and Literary Society Reports, 1866-72.	
Lias of Barrow in Leicestershire . .	P. B. Brodie.
Liverpool Gallery of Inventions and Science, Annual Report, 1862.	
„ Geological Society Proceedings, 1860-61, 1863-4, 1867-8, 1869-70, 1870-71, 1871-72.	
„ Literary and Philosophical Society Proceedings, 1863.	
London Institution, Journal of.	
Lower Lias of Leicestershire . . .	P. B. Brodie.
Manchester Geological Society Transactions.	
Mineral Resources of Central Italy (Supplement)	W. P. Jervis.
Mineralogical Contributions . . .	Dr. H. Miller.

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Miners' Association of Cornwall and Devon, Report of Meeting, Jan. 12th, 1872.	
Moss Flora of Sussex	C. P. Smith.
Motions of Eugenic Acid on Water . .	C. Tomlinson.
Nature, Origin, and Geological History of Amber	P. B. Brodie.
Nomenclature of the Foraminifera . .	Parker & Jones.
Notes pour server à une Description Geologique des Montagnes Rocheuse . .	J. Marcou.
Notice of Opinions on the Red Limestone of Hunstanton	H. Seeley.
Notices of Rocks and Fossils in the University Museum, Oxford.	
Nova Scotia and her Resources . .	T. F. Knight.
" Institute of Natural Science Proceedings and Transactions, 1871-72.	
" International Exhibition Catalogue, 1862.	
" Reports of Chief Commissioners of Mines, 1864-70-71.	
" Report of the Sherbrooke Gold District.	
Occurrence of Footprints of Cheirotherium in the Upper Keuper Beds .	P. B. Brodie.
" Graphularia Wetherellii in Nodules from the London Clay and Crag	N. T. Wetherell.
Orleans (U.S.) County Society Transactions, Vol. i., Nos. 1, 2, 3.	
Phenomena attending the Fall of Meteorites	W. Von Haidenger.
Peat and Peat Charcoal	W. H. Buckland.
Phosphatic and Bone Beds in British Strata	P. B. Brodie.
Plymouth Institution and Devon and Cornwall Natural History Society Transactions, 1861-62-63-65-67-70-71.	
Post Glacial Deposits of Lancashire and Cheshire	C. E. De Rance.
Products and Resources of Tasmania, International Exhibition, 1862.	

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Progress of the Geological Survey in Scotland	A. Geikie.
Purbeck Strata, &c., at Swindon, Wilts .	P. B. Brodie.
Quekett Microscopical Club Journal, Nos. 1 to 19.	
„ „ Reports, 1867 to 1871.	
Raised Beach at Portland Bill . .	W. Whitaker.
Reply to the Criticisms of James D. Dana.	J. Marcou.
Rhætic Sections	H. H. Winwood.
Royal Horticultural Society Journal, Vol. i., part 4.	
Royal Irish Academy Transactions, Vol. xxiv., parts 4, and 8 to 15.	
Silurian Anthracite of Cavan . . .	J. I. Whitty.
South Australia, Account of the Colony of, International Exhibition, 1862.	
„ Africa and its Diamonds . . .	Rupert Jones.
„ African Diamonds	J. Tennant.
„ Wales Institute of Engineers' Proceedings, 1866-72.	
Structure, &c., of Dicanograptus . .	J. Hopkinson.
Study of Geology	J. L. Lobley.
Surface Geology of London . . .	W. Whitaker.
Sur le Neocomien dans la Jura . . .	J. Marcou.
Two Days in a Mining District . .	J. L. Lobley.
„ on the Chesil Bank . . .	C. Tomlinson.
Two New Genera of Palæozoic Crinoids .	L. De Koninck.
Warwickshire Natural History and Archæological Society Reports, 1857-58-59-60-61-64-70-71-72.	
„ Naturalists' and Archæologists' Field Club Proceedings, 1862-63-64-65-66-67-69-70-71.	
Yorkshire Geological and Polytechnic Society of the West Riding Proceedings, 1865-66-71-72.	
„ „ Reports, 1864-66-69-70.	

NOTE.—*Members in applying for Books are requested to state the number as well as the name of the volume they require.*

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Societies to which the "Proceedings" of the Geologists' Association are presented.

Anthropological Institute of Great Britain.
Belfast Naturalists' Field Club.
Berwickshire Naturalists' Field Club.
Bath Royal Literary and Scientific Institution.
Brighton and Sussex Natural History Society.
Cambridge Philosophical Society.
Cotteswold Naturalists' Field Club.
Dudley Geological Society.
Geological and Polytechnic Society of the West Riding of Yorkshire.
Geological Society of Dublin.
Geological Society of London.
Glasgow Geological Society.
Leeds Philosophical and Literary Society.
Liverpool Geological Society.
London Institution.
Malvern Naturalists' Field Club.
Manchester Geological Society.
Philosophical Society of Newcastle.
Philosophical Society of Yorkshire.
Quekett Microscopical Club, London.
Royal Geological Society of Cornwall.
Royal Irish Academy, Dublin.
Royal Physical and Wernerian Society of Edinburgh.
Royal Cornwall Polytechnic Society.
Royol Geographical Society.
Royal School of Mines.
Royal Society of Edinburgh.
Somersetshire Archæological and Natural History Society.
South Wales Institute of Engineers.
Tyneside Naturalists' Field Club.
Warwickshire Natural History and Archæological Society.
Warwickshire Naturalists' Field Club.
Woolhope Naturalists' Field Club.
Worcestershire Naturalists' Field Club.
Worcestershire Natural History Society.

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LAWS

OF

THE GEOLOGISTS' ASSOCIATION.

I.

That the Society be called THE GEOLOGISTS' ASSOCIATION.

II.

That the object of the Association be to facilitate the study of Geology and its Allied Sciences by the holding of Meetings for the reading of Papers, and the delivery of Lectures, by Excursions, the formation of a Library, and the publishing of Proceedings.

III.

That the Association consist of Ordinary and Honorary Members, and that Ladies be eligible for election.

IV.

That Members have the privilege of attending the Ordinary Meetings and Excursions of the Association, and of introducing two Visitors at any such Meeting or Excursion, be entitled to the use of the Library in accordance with the Library Regulations, and to receive a copy of all publications of the Association issued during their membership.

V.

That every Candidate for admission be proposed by two or more Members, who shall sign a certificate in recommendation of such Candidate, which certificate shall set forth the name and place of residence of the Candidate.

VI.

That the Proposer whose name stands first upon the certificate have personal knowledge of the Candidate, and certify to that effect upon the certificate.

VII.

That the certificate of the Candidate be read by the Secretary at the Ordinary Meeting following the receipt of the certificate, and that the election take place at the succeeding Meeting.

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VIII.

That the method of voting for the election of Members be by ballot.

IX.

That the negative votes of one-sixth of the Members voting exclude a Candidate.

X.

That the Annual Subscription for Ordinary Members be Ten Shillings (except in the case of Country Members elected previous to January, 1863).

XI.

That Members may commute the Annual Subscription by a payment of Five Pounds Five Shillings.

XII.

That Ordinary Members pay an Admission Fee of Ten Shillings.

XIII.

That Subscriptions become due on the 1st of January in each year; in the case of a new Member, immediately after his or her election, but that Members elected during the months of November and December shall not be required to pay for the year in which they were elected.

XIV.

That no Member be entitled to any of the privileges of the Association whose Subscription shall be twelve months in arrear; and that any Member whose Annual Subscriptions are two years in arrear may be excluded from the Association by the General Committee, and when so excluded shall cease to be a Member of the Association.

XV.

That the management of the Association be vested in a President, four Vice-Presidents, a Treasurer, an Honorary Secretary, an Honorary Librarian, and twelve other Members, who shall constitute a General Committee, to be elected annually at the Annual General Meeting by ballot; the senior Vice-President and the two Senior Members of the General Committee, who shall not have held, during the preceding year, any other office, shall not be

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eligible for re-election to their respective offices until the next Annual General Meeting.

XVI.

That the members of the General Committee attending each meeting of such Committee sign their names in a book kept for the purpose; five members to form a quorum.

XVII.

That the General Committee be sub-divided into such sub-committees as may be desirable, and may associate ordinary Members on any such sub-committee.

XVIII.

That for the purpose of the legal protection of the property of the Association, all the funds, books, and other property of the Association be declared to be vested in three or more Trustees, who shall be members of the Association, to be appointed by the General Committee; but the General Committee shall have power, by the vote of a majority of its whole number, to sell or otherwise dispose of any duplicate specimens, books, or other property which it may not seem to them advisable to retain.

XIX.

That minutes be kept of the Meetings of the Association and of the General Committee, and that the minutes of each Meeting be read as the first business of the next ensuing Meeting of the same kind.

XX.

That the Ordinary Meetings of the Association be held on the first Friday in each month (except during the months of August, September, and October) at eight o'clock in the evening, but that the General Committee may alter the day of Meeting.

XXI.

The General Committee may, whenever they think fit, and they shall, upon a Requisition signed by not less than twelve Members, convene a Special General Meeting of the Association. That one month's notice shall be given from the Chair of every Special General Meeting, and a printed notice sent to each Member of the Association not less than fourteen days before such meeting, and

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the object stated; and no business shall be considered at such Meeting except that for which it was specially convened.

XXII.

That the Accounts of the Association shall be made up to the 31st December in each year, and audited by two Auditors, who shall be appointed at the Ordinary Meeting following; and the Balance-sheet shall be submitted, together with a Report of the general progress of the Association during the preceding year, to an Annual General Meeting, which shall be held at such hour before the first Ordinary Meeting in February as the General Committee shall appoint.

XXIII.

That in case of a vacancy arising in any office of the Association, or in the General Committee, the General Committee have power to fill up such vacancy until the next Annual General Meeting of the Association.

XXIV.

That gentlemen of eminence in geological science, or who have done some special service to the Association, may be recommended by the General Committee for election as Honorary Members at the Annual General Meeting, and shall, upon being elected, have full privileges of membership, but that the number of Honorary Members shall not exceed twenty.

XXV.

That a copy of these Laws be delivered to each Member upon election to membership of the Association.

XXVI.

That no Law be altered, except by a majority of votes of those present at a Special General Meeting called for that purpose.

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ANNUAL REPORT

OF THE

GEOLOGISTS' ASSOCIATION

FOR

1879,

TOGETHER WITH

LIST OF MEMBERS,

LAWS OF THE ASSOCIATION, &c.

LONDON:
UNIVERSITY COLLEGE.
FEBRUARY, 1880.

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PAST PRESIDENTS.

TOULMIN SMITH, Esq.	1859
The Rev. THOMAS WILTSHIRE, M.A., F.G.S., &c. .	1859
" " " " " .	1860
" " " " " .	1861
Professor JAMES TENNANT, F.G.S., F.R.G.S., &c. .	1862
" " " " " .	1863
EDWARD CRESY, Esq.	1864
" "	1865
C. T. RICHARDSON, Esq., M.D.	1866
" " "	1867
Professor JOHN MORRIS, M.A., F.G.S. . . .	1868
" " "	1869
" " "	1870
The Rev. THOMAS WILTSHIRE, M.A., F.G.S., &c. .	1871
" " " " " .	1872
HENRY WOODWARD, Esq., LL.D., F.R.S., F.G.S., &c.	1873
" " " " " .	1874
WILLIAM CARRUTHERS, Esq., F.R.S., F.L.S., F.G.S.	1875
" " " " " .	1876
Professor JOHN MORRIS, M.A., F.G.S. . . .	1877
" " " "	1878

ALEX. RIVINGTON, PRINTER, LEWES.

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REPORT

OF THE

GENERAL COMMITTEE

For the Year 1879.

Your Committee have again, as on the last occasion, to regret the small number of new Members elected during the past year, and now as then they find that this is by no means peculiar to this Association, but has happened to other scientific societies in the Metropolis. This falling off is probably to be attributed in part to such continued depression in so many branches of industry as to draw away the attention of those whose occupations are not purely of a scientific nature—those, in fact, who constitute the great bulk of the members of these societies, from the pursuit of science in their leisure hours; with the return of commercial prosperity we may reasonably hope for a large increase in the number of our Members. In part, also, the decrease is to be attributed to the many local societies that have lately come into existence, some of which, indeed, may almost be said to be offshoots of this Association; this, however, will in the end probably increase the number of our Members by fostering a taste for scientific pursuits.

Members elected during 1879 . . .		27
Deaths	5	
Withdrawals and exclusions .	21—	26
Increase		1

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The Census of the Association on January 1, 1880, was as follows:—

Honorary Members	15
Life Members	69
Old Country Members	20
	104
Other Members	311
	415

The following Members have died during 1879:—Dr. Ogier Ward, Rev. J. Cornthwaite, Mr. W. Newall, Colonel J. J. Gibb, and Miss Jelly.

The decrease in the number of our Members has of course given rise to a falling off in the Income of the Association, and as there also happens to have been, during the past year, an unusually heavy expenditure on account of printing—for which, however, it is to be hoped, the Members have had full value, the expenses have somewhat exceeded the income. As it is not desirable that this should happen without urgent necessity, your Committee are fully alive to the advisability of economy.

The additions to the Library during the past year are numerous, and include amongst others an important series of papers on the Pre-Cambrian rocks of England, by Dr. Hicks, to whom the Society is indebted for their presentation.

A list of these additions will shortly be published for the use of Members.

Your thanks are again due to Mr. E. Litchfield for the great assistance he has rendered on Meeting-nights by his kindness in superintending the issue and return of books.

The following Museums and Geological Collections were visited during 1879:—

British Museum—

Where Prof. Seeley, F.R.S., gave a demonstration on Dinosauria.

British Museum—

Where Dr. Henry Woodward, F.R.S., gave a demonstration on Cephalopoda.

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College of Surgeons—

Where Prof. Flower, F.R.S., gave a demonstration on Cetacea.

At Mr. Piper's house, Ledbury—

A Collection of Silurian Fossils of the neighbourhood was examined by those who took part in the Excursion to Ledbury.

The Excursions during the past year have been unusually numerous, and on the whole well attended, notwithstanding the ungenial spring and summer.

The longer Excursions were all to districts lying to the westward of London, and embraced a considerable variety of formations; but the chief feature of the season was a series of Excursions from the London Tertiary Basin to the summit of the Weald.

These Excursions, five in number, were most ably directed by Mr. Lobley, whose time and intimate acquaintance with the geology of the district south of the Thames have been so often at the disposal of the Association. Those Members who are unable to go far afield were thus afforded an excellent opportunity for studying the physiography of that remarkable region which forms the southern curve of the London Basin in the western part of Kent.

A list of all the Excursions, giving the Localities, Directors, and principal Formations, is subjoined.

LOCALITIES.	DIRECTORS.	PRINCIPAL FORMATIONS.
Weymouth & Portland.	Rev. J. F. Blake, M.A., F.G.S. W. H. Hudleston, Esq., M.A., F.G.S.	Chalk, "Upper Greensand," Hastings Sands, Purbecks, Portland Stone and Sand, Kimmeridge Clay, Corallian Series, Oxford Clay.
Crayford & Erith.	Prof. J. Morris, M.A., F.G.S.	Lower Brick-earths of the Thames Valley, Thanet Sands, Chalk.
Newbury.	The President. Walter Money, Esq., F.S.A.	Low-level Gravels and Peat Beds, High-level Gravels, Bagshot Series, London Clay, Woolwich and Reading Series, Chalk.
Orpington & Knockholt. (1st of Wealden Series.)	J. Logan Lobley, Esq., F.G.S.	Valley Gravels, Thanet Sands, Chalk.

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LOCALITIES.	DIRECTORS.	PRINCIPAL FORMATIONS.
Watford.	Wm. Whitaker, Esq., B.A., F.G.S. John Hopkinson, Esq., F.G.S., F.L.S.	Terrace Gravel, Drifts, Reading Beds, Chalk.
Knockholt & Sevenoaks. (2nd of Wealden Series.)	J. L. Lobley, Esq., F.G.S.	Chalk, Gault, Folkestone Beds, Hythe Beds (Kentish Rag).
Bath.	Charles Moore, Esq., F.G.S.	Westbury Iron Ore (Corallian), Inferior Oolite, Lias, Rhætic, Carboniferous Limestone.
Sevenoaks & Tunbridge. (3rd of Wealden Series.)	J. L. Lobley, Esq., F.G.S.	Gault, Folkestone Beds, Hythe Beds.
Tonbridge & Tunbridge Wells. (4th of Wealden Series.)	J. L. Lobley, Esq., F.G.S.	Weald Clay, Tunbridge-Wells Sands, Wadhurst Clays, Ashdown Sands.
Tunbridge Wells & Crowborough Beacon. (5th of Wealden Series.)	J. L. Lobley, Esq., F.G.S.	The same subdivisions of the Wealden formation.
Ledbury.	G. H. Piper, Esq., F.G.S. Dr. Chas. Callaway, M.A., F.G.S. Dr. Hicks, F.G.S.	Old Red Sandstone. Upper Ludlow Aymestry Limestone Lower Ludlow Wenlock Limestone and Shale, Woolhope Limestone (Upper Silurian.) Upper Llandovery Sandstone and Conglomerate, Hollybush Sandstone, Crystalline and Eruptive Rocks.

The thanks of the Association are due to the following for assistance and hospitality at the Excursions:—The Marquis of Abergavenny, G. H. Piper, Esq, F.G.S., Chas. Callaway, D.Sc., F.G.S., Mrs. Devas, and the Members of the Malvern Field Club.

Your Committee have endeavoured by the addition of a few simple diagrammatic illustrations to render the programme of the Excursions as instructive as possible; and the thanks of the Association are due to the various Directors for their readiness in

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supplying all necessary information on matters connected with the organisation of the Excursions.

The Meetings were well attended during the year.

The Address by the President at the opening of the Session, 1879-80, attracted an unusually large audience, and was listened to with much interest and attention, filled as it was with geological facts of the greatest importance.

The following Papers were read :—

On the British Eocenes and their Deposition, by J. S. GARDNER, Esq., F.G.S.
On the Insect Fauna of the Palæozoic Period, and the British and Foreign Formations of that Period in which Insect Remains have been detected, by H. GOSS, Esq., F.G.S., F.L.S.
On the Gault, by F. G. H. PRICE, Esq., F.G.S.
On the Fossil Corals obtained from the Oolite of the Railway-Cuttings near Hook Norton, Oxfordshire, by R. F. TOMES, Esq., F.G.S.
Notes on the Rev. J. F. Blake's Paper on the Chalk of Yorkshire, by Dr. CHAS. BARROIS, and reply by the Rev J. F. BLAKE, F.G.S.
On the Dinosauria, by Prof. G. H. SEELEY, F.R.S., F.G.S.
On the Age of the Principal Mountain Ranges of the Globe, by J. LOGAN LOBLEY, Esq., F.G.S.
On the Nature and Origin of Peat-bogs, by the PRESIDENT.
On Geology and its Uses (Address), by the PRESIDENT.
On the Origin and Petrology (specially of South Side) of Salisbury Crags, Edinburgh, by ANDREW TAYLOR, Esq., F.C.S.

Your thanks are still due to the Council of University College, for the continuance of their liberality in granting us the use of their spacious Library for our Monthly Meetings.

Your thanks are also due to the Quekett Microscopical Club, for the use of their lamps at our Annual Meetings.

Your Committee have much pleasure in recommending for election as Honorary Member of this Association Prof. W. H. Flower, LL.D., F.R.S., Conservator of the Hunterian Museum, and President of the Zoological Society, so well known by his important contributions to the Comparative Anatomy of the Mammalia, and more especially by his memoirs on the Cetacea. His lectures on Fossil Mammalia were an important contribution to geological science; but the Members of this Association are particularly indebted to him for many instructive demonstrations on subjects of geological interest from the admirable collections in the Hunterian Museum.

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BALANCE SHEET OF THE ASSOCIATION

For the Year ending December 31st, 1879.

Dr.

		£	s.	d.
To Balance, January 1st, 1879		74	14	6
„ Sale of Publications		4	0	4
„ January and July Dividends on £340 17s. 8d. *Consols*		10	0	4
„ Life Compositions		40	10	0
„ Entrance Fees	£11 0 0			
„ Annual Subscriptions	£118 13 6			
		129	13	6
		£258	18	8

Cr.

	£	s.	d.
By Printing and Illustrating "Proceedings"*	112	8	5
„ Miscellaneous Printing, including the Library Catalogue, Report, and Circulars with Illustrations	42	12	5
„ Library	4	1	0
„ Fire Insurance up to 25th Dec., 1880... ...	1	17	6
„ Postage and Addressing	34	14	8
„ Stationery	1	19	11
„ Gas, Attendance, and Miscellaneous Items	21	1	9
Balance brought forward	40	3	0
	£258	18	8

1880.—January 1. To Balance in hand ... £40 3 0

Examined and found correct,
H. GOSS,
H. M. KLASSEN, } Auditors.

University College, London,
Jan. 31, 1880.

J. FOULERTON, M.D.,
Sec.

* It should be mentioned that for illustrations only £1 of this amount was paid by the Association; the respective authors of the papers in Vol. V., Nos. 7 and 8, and Vol. VI., Nos. 1, 2, 3, having liberally paid for illustrating them.

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LIST OF MEMBERS.

LAWS OF THE ASSOCIATION, &c.

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HONORARY MEMBERS.

Year of Election.

1862. The Rev. DAVID HONEYMAN, D.C.L., F.G.S., &c., Antigonish, Nova Scotia.

1867. JOHN MORRIS, M.A., F.G.S., &c., Emeritus Professor of Geology and Mineralogy, University College, London, 15, Upper Gloucester Place, Dorset Square, N.W.

1870. WILLIAM CARRUTHERS, F.R.S., F.L.S., F.G.S., British Museum.

1870. B. WATERHOUSE HAWKINS, F.L.S., F.G.S., New York.

1870. THOMAS RUPERT JONES, F.R.S., F.G.S., Professor of Geology, Royal Military College, Sandhurst, Silberhorn, Camberley, Surrey (President).

1871. THOMAS DAVIDSON, F.R.S., F.G.S., &c., Vice-President of the Palæontographical Society, 3, Leopold Road, Brighton.

1871. CHARLES MOORE, F.G.S., &c., 6, Cambridge Place, Bath.

1872. ROBERT ETHERIDGE, F.R.S., F.R.S.E., F.G.S., Palæontologist to the Geological Survey of Great Britain, 28, Jermyn Street, S.W.

1873. The Rev. THOMAS WILTSHIRE, M.A., F.L.S., F.G.S., F.R.A.S., &c., 25, Granville Park, Lewisham, S.E.

1875. HENRY WOODWARD, LL.D., F.R.S., F.G.S., F.Z.S., Beaufort Street, Chelsea.

1875. WILLIAM WHITAKER, B.A., F.G.S., H.M. Geological Survey, Museum, Jermyn Street, S.W.

1876. Sir CHARLES STRICKLAND, Bart., Hildenley Hall, Malton.

1876. The PRESIDENT OF THE GEOLOGICAL SOCIETY, Burlington House, W.

1878. RICHARD OWEN, C.B., M.D., D.C.L., LL.D., F.R.S., F.L.S., F.G.S., Assoc. Inst. de France, Superintendent of the Natural History Departments, British Museum, Sheen Lodge, Richmond Park, Surrey, W.

1879. Dr. F. V. HAYDEN, of the Geological and Geographical Survey of the U.S. Territories.

1880. WILLIAM HENRY FLOWER, LL.D., F.R.S., F.G.S., F.L.S., Hunterian Professor of Comparative Anatomy and Conservator of the Museum, Royal College of Surgeons, Lincoln's-Inn-Fields, W.C.

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ORDINARY MEMBERS.

Names having * prefixed are those of Life Members, who have compounded for their Annual Subscriptions.

Names having † prefixed are those of Country Members elected previous to January, 1863, and who pay an Annual Subscription of Five Shillings only.

Year of Election.

1872. Abraham, Phineas S., B.A., B.Sc., 26, Montague Place, W.C.

1859. *Adams, William, F.G.S., &c., 53, Crockherb Town, Cardiff.

1873. Addy, John, Peterborough.

1874. Austin, Stephen, Bayley Lodge, Hertford.

1878. Badcock, John, jun., 2, Banbury Road, South Hackney, E.

1859. Badcock, P., 4, Aldridge Road Villas, Westbourne Park, W.

1861. Bailey, John W., 75, Broke Road, Dalston, N.E.

1871. Baldwin, Arthur Ernest, Sunnydale, The Avenue, Lee, S.E.

1876. *Balston, William G., Bearsted House, Bearsted, Maidstone.

1876. Bamford, Herbert, 14, Vanburgh Park Road West, Blackheath, S.E.

1875. Barber, Mrs. William, Barrow Point, Pinner.

1876. Barker, Richard.

1874. Barnard, Major R. Carey, F.L.S., Bartlow, Leckhampton, Cheltenham.

1875. *Barrois, Charles, 27, Rue Rousselle, Faub. St. Maurice, Lille, Dept. du Nord, France.

1860. Bartlett, W. H., 4, Great George Street, Westminster, S.W.

1860. †Barugh, Lieut. J., Charlestown, Bridlington, Yorkshire.

1874. *Beardmore, Nathaniel St. Bernard, 30, Great George Street, Westminster, S.W.

1871. Beale, W. Phipson, F.G.S., F.C.S., 3, Victoria Street, Westminster, S.W.

1870. Bedwell, Francis Alfred, M.A., F.R.M.S., Fort Hall, Bridlington Quay, Yorkshire.

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1871. Beesley, Thomas, F.C.S., 5, High Street, Banbury.
1877. Bell, Joseph A., 6, Mount Pleasant Villas, Crouch Hill, N.
1876. Belsham, Oliver Daniel, Heybridge, Maldon.
1877. Belshaw, Maurice, Heybridge, Maldon, Essex.
1858. †Bentley, J., Glintod, Market Deeping.
1872. Berry, Frederick, 6, Long Lane, City.
1876. Bessemer, Alexander, B.A., 12, Montague Place, Bryanstone Square, W.
1878 *Bird, Ernest, Engham Lodge, Wood Land, Shepherd's Bush, W.
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1876. Sack, Hermann, B.A., Ph.D., C.E., &c., 47, Larkhall Lane, Clapham, S.W.
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1874. *Sanders, Rev. S. J. W., M.A., LL.M., F.G.S., Grammar School, Northampton.
1861. *Saul, G. T., 33, Bow Road, E.
1876. Saul, John, 23, Alexandra Villas, Finsbury Park, N.
1858. *Saunders, James E., F.G.S., &c., 9, Finsbury Circus, E.C.
1868. Scatliff, John Parr, M.D., M.R.C.S., The Elms, Clapham Common, Southside, S.

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1873. *Sclater, Philip Lutley, M.A., Ph.D., F.R.S., 11, Hanover Square, W.
1879. Scott, Lawrence, 21, Harewood Square, N.W.
1872. *Scriven, John Bagot, 15, Maddox Street, W.
1862. †Serocold, Charles Pearce, F.G.S., Taplow, Bucks.
1876. Shakespear, Col. John Davenport, Scientific Club, 4, Savile Row, W.
1877. Short, Frederick, 2, King Street, Borough, S.E.
1875. Shrubsole, W. H., Sheerness-on-Sea.
1871. Slade, Jeremiah, F.G.S., Fern Villa, Lion Road, Benley Heath.
1873. Sloper, G. Elgar, Devizes, Wilts.
1873. Sloper, S. W., Devizes, Wilts.
1870. Smith, Francis L., 3, Grecian Cottages, Crown Hill, Norwood, S.
1859. Smith, G., 73, Farringdon Street.
1877. Smithson, Ed. W., St. Mary's Lodge, York.
1878. Sollas, W. J., B.A., Curator, Bristol Museum, Bristol.
1865. *Southwell, Charles, Gurrey Lodge, Finchley Road, Kilburn, N.W.
1871. Spawforth, G. W.
1861. Spink, J., Vine Lodge, Sevenoaks, Kent.
1875. Spon, Ernest, Mining Civil Engineer, 16, Craven Street, Charing Cross, S.W.
1878. Spratling, Wm. J., B.Sc.Lond., F.G.S., Hatcham Schools, Hatcham, S.E.
1876. Stanley, William Ford, South Norwood.
1871. St. Clair, Rev. George, F.G.S., F.E.S., 70, Wheeley's Road, Edgbaston, Birmingham.
1880. Stephens, R. Darell, F.G.S., Chednock, Bridport, Dorset.
1873. Stirling, James, M.A., Union Bank Chambers, 61, Carey Street, W.C.
1872. Stone, W. T., Watford Heath, Herts.
1872. *Sutherland, William Paton, Hazlemere Lodge, Parkside, Beckenham, S.E.
1871. Swain, Ernest, F.G.S., 34, Elsham Road, Kensington, W.
1872. Swan, Robert, 7, New Square, Lincoln's Inn, W.C.

1869. Taylor, Charles, Oakleigh, Mount Ephraim Road, Streatham, S.

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1873. Taylor, John Ellor, F.L.S., F.G.S., The Mount, Ipswich.
1872. Taylor, William, 45, Beach Street, Barbican, E.C.
1874. Teale, J. J. Harris, B.A., F.G.S., 9, All Saints' Street, Nottingham.
1858. Tennant, Professor James, F.G.S., F.C.S., F.R.G.S., F.Z.S., F.R.M.S., F.M.S., &c., 149, Strand, W.C.
1875. Thairwall, F. J., 169, Gloucester Road, Regent's Park, N.W.
1866. Thoms, William, 36, Spencer Street, Goswell Road, E.C.
1876. Tinson, Gerald E.
1879. Tooke, William A., J.P., Pinner Hill, Pinner, Middlesex.
1874. Trickett, Frank, 4, Springfield, Upper Clapton, E.
1874. Trickett, Samuel, 4, Springfield, Upper Clapton, E.
1860. †Tripp, Miss S. G., Rectory, Spofforth, Tadcaster, Yorkshire.
1877. *Tryon, Henry.
1876. Tylor, Alfred, F.G.S., Shepley House, Carshalton.

1862. †Valpy, Rev. J. J. C., Rectory, Elsing, East Dereham, Norfolk.
1861. †Vicary, William, F.G.S., F.R.M.S., F.M.S., The Priory, Colleton Crescent, Exeter.
1878. Vizard, Philip Edward, 18, Lyndhurst Road, Hampstead.

1862. †Wadeson, James, Goswell Road, Windsor.
1871. Walker, Henry, F.G.S., 6, Oakington Road, St. Peter's Park, W.
1874. *Walker, John Francis, M.A., F.L.S., F.G.S., F.C.S., 16, Gillygate, York.
1877. *Walker, William, F.G.S., 18, Lendal, York.
1872. *Walmisley, Arthur T., Assoc. Inst. C.E., 5, Westminster Chambers, Victoria Street, S.W.
1872. Warburton, Thomas, F.G.S., 11, Grange Road, Canonbury Park, N.
1862. *Ward, J. Whiteley, F.R.M.S., South Royde, Halifax.
1876. Warton, Lieut. R. G., Naval and Military Club, Piccadilly.
1859. *Watson, J. T. W., C.E., Ph.D., F.G.S.
1879. Webb, Augustus W., 163, Malmesbury Road, Bow, E.
1878. Webb, Sidney, 45, Cranbourne Street, Leicester Square, S.W.

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1871. Westendarp, Charles Henry, F.R.G.S., 19, Stanley Crescent, Kensington Park, W.
1877. Westlake, Ernest, Fordingbridge, Salisbury.
1874. Wetherell, John William, North Grove, Highgate, N.
1867. White, Charles, 20, Woodlands Terrace, Blackheath, S.E.
1874. White, Captain E. H., late Royal Marines, Arnold House, Chester.
1876. Whitwell, William, Holgate, York.
1867. *Wigram, Robert, F.G.S., Blackwall, E.
1874. Wildy, Augustus, F Z.S., 116, Regent's Park Road, N.W.
1877. Wilson, Charles Joseph, 14, Highbury Crescent, N.
1859. Wiltshire, Mrs. T., 25, Granville Park, Lewisham, S.E.
1875. *Winstone, B., M.R.C.S., 53, Russell Square, W.C.
1876. Winser, John Johnston, Newton Abbott, Devonshire, and 70, Chancery Lane, W.C.
1876. *Wolfram, H., The Manor House, Old Road, Lee, S.E.
1875. Wood, Richard, M.D., Driffield, Yorkshire.
1875. Woodall, John W., M.A., F.G.S., St. Nicholas House, Scarborough.
1874. Woodward, Bernard Barham, *Librarian*, Printed Book Dept., British Museum, W.C., and 19, Stowe Road, Shepherd's Bush, W.
1873. Woodward, Bernard Henry, 80, Petherton Road, Highbury New Park, N.
1874. Woodward, Horace Bolingbroke, F.G.S., of the Geological Survey of England and Wales, President Geol. Soc., Norwich, 28, Jermyn Street, S.W.
1877. Wragg, George, Berwyn Lodge, Dulwich, S.
1872. Wray, Cecil, Woodend House, Walthamstow, E.
1868. Wright, Bryce McMurdo, F.R.G.S., F. R. Hist. Soc., &c., Hesket House, Guildford Street, Russell Square, W.C.

1874. Young, John T., F.G.S., 32, Mount Street, Whitechapel, E.
1879. Young, Keith D., 30, Guildford Street, Russell Square, W.C.

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LIST OF MEMBERS WHOSE ADDRESSES ARE UNKNOWN.

Barker, Rd.
Blakesley, T. H.
Bond, G.
*Clement, J. H.
Cooper Edmund.
Curtis, C. N. O.
Dixon, A. C.
*Hobden, Hy.
Langridge, Herbert A.
Maier, Julius.
Naidley, Henry.
*Neison, F. C. P.
Oliver, Rev. W. E.
Robertson, Ed. H.
Spawforth, G. W.
Tinson, Gerald E.
*Tryon, Hy.
Watson, J. T. W.

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Societies, etc., to which the "Proceedings of the Geologists' Association" are Presented.

(Those marked * send theirs in exchange.)

Advocates' Library, Edinburgh.
Anthropological Institute of Great Britain.
*Bath Royal Literary and Scientific Institution.
*Belfast Naturalists' Field Club.
*Berwickshire Naturalists' Field Club.
Bodleian Library, Oxford.
*Brighton and Sussex Natural History Society.
*Bristol Naturalists' Society.
British Museum Library.
Cambridge Philosophical Society.
*Cotteswold Naturalists' Field Club.
Dudley Geological Society.
*Edinburgh Geological Society.
Editor of "Record of Geological Literature."
Editor of "Geological Magazine."
Editor of "Nature."
Editor of "Popular Science Review."
Editor of "Science Gossip."
*Geological and Polytechnic Society of the West Riding of Yorkshire, Leeds.
*Geological Society of Glasgow.
*Geological Society of London.
Hertfordshire Natural History Society and Field Club.
King's College, Cambridge.
*Leeds Philosophical and Literary Society.
*Literary and Philosophical Society of Liverpool.
Literary and Philosophical Society of Newcastle-on-Tyne.
*Liverpool Geological Society.
London Institution.
Malvern Naturalists' Field Club.
*Manchester Geological Society.

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*Natural History Society of Glasgow.
*Norwich Geological Society.
*Plymouth Institution and Devon and Cornwall Natural History Society.
*Quekett Microscopical Club (London).
*Royal Cornwall Polytechnic Society.
Royal Geographical Society.
University of Dublin.
Royal Geological Society of Cornwall (Penzance).
Royal Geological Society of Ireland (Dublin).
*Royal Irish Academy (Dublin).
*Royal Institution of Cornwall.
Royal Physical Society (Edinburgh).
Royal School of Mines (London).
*Royal Society of Edinburgh.
*Smithsonian Institution (Washington, U.S.)
*Society of Arts.
*Societé Geologique de France.
*Somersetshire Archæological and Natural History Society.
*South Wales Institute of Engineers.
Trinity College, Dublin.
*Tyneside Naturalists' Field Club.
*United States Geological and Geographical Survey of the Territories.
University College Library.
University Library, Cambridge.
*Warwickshire Natural History and Archæological Society.
*Warwickshire Naturalists' and Archæologists' Field Club.
*Winchester and Hampshire Scientific and Literary Society.
*Woolhope Naturalists' Field Club.
Worcestershire Naturalists' Field Club.
Worcestershire Natural History Society.
*Yorkshire Philosophical Society (York).

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LAWS
OF
THE GEOLOGISTS' ASSOCIATION.

I.

That the Society be called THE GEOLOGISTS' ASSOCIATION.

II.

That the object of the Association be to facilitate the study of Geology and its Allied Sciences by the holding of Meetings for the reading of Papers, and the delivery of Lectures, by Excursions, the formation of a Library, and the publishing of Proceedings.

III.

That the Association consist of Ordinary and Honorary Members, and that Ladies be eligible for election.

IV.

That Members have the privilege of attending the Ordinary Meetings and Excursions of the Association, and of introducing two Visitors at any such Meeting or Excursion, be entitled to the use of the Library in accordance with the Library Regulations, and to receive a copy of all publications of the Association issued during their membership.

V.

That every Candidate for admission be proposed by two or more Members, who shall sign a certificate in recommendation of such Candidate, which certificate shall set forth the name and place of residence of the Candidate.

VI.

That the Proposer whose name stands first upon the certificate have personal knowledge of the Candidate, and certify to that effect upon the certificate.

VII.

That the certificate of the Candidate be read by the Secretary at the Ordinary Meeting following the receipt of the certificate, and that the election take place at the succeeding Meeting.

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VIII.

That the method of voting for the election of Members be by ballot.

IX.

That the negative votes of one-sixth of the Members voting exclude a Candidate.

X.

That the Annual Subscription for Ordinary Members be Ten Shillings (except in the case of Country Members elected previous to January, 1863).

XI.

That Members may commute the Annual Subscription by a payment of Five Pounds Five Shillings.

XII.

That Ordinary Members pay an Admission Fee of Ten Shillings.

XIII.

That Subscriptions become due on the 1st of January in each year; in the case of a new Member, immediately after his or her election, but that Members elected during the months of November and December shall not be required to pay for the year in which they were elected.

XIV.

That no Member be entitled to any of the privileges of the Association whose Subscription shall be twelve months in arrear; and that any Member whose Annual Subscriptions are two years in arrear may be excluded from the Association by the General Committee, and when so excluded shall cease to be a Member of the Association.

XV.

That the management of the Association be vested in a President, four Vice-Presidents, a Treasurer, a Secretary, an Editor, a Librarian, and twelve other Members, who shall constitute a General Committee, to be elected annually at the Annual General Meeting by ballot; the senior Vice-President and the two Senior Members of the General Committee, who shall not have held, during the preceding year, any other office, shall not be

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eligible for re-election to their respective offices until the next Annual General Meeting.

XVI.

That the members of the General Committee attending each meeting of such Committee sign their names in a book kept for the purpose; five members to form a quorum.

XVII.

That the General Committee be sub-divided into such sub-committees as may be desirable, and may associate ordinary Members on any such sub-committee.

XVIII.

That for the purpose of the legal protection of the property of the Association, all the funds, books, and other property of the Association be declared to be vested in three or more Trustees, who shall be Members of the Association, to be appointed by the General Committee; but the General Committee shall have power, by the vote of a majority of its whole number, to sell or otherwise dispose of any duplicate specimens, books, or other property which it may not seem to them advisable to retain.

XIX.

That minutes be kept of the Meetings of the Association and of the General Committee, and that the minutes of each Meeting be read as the first business of the next ensuing Meeting of the same kind.

XX.

That the Ordinary Meetings of the Association be held on the first Friday in each month (except during the months of August, September, and October) at eight o'clock in the evening, but that the General Committee may alter the day of Meeting.

XXI.

The General Committee may, whenever they think fit, and they shall, upon a Requisition signed by not less than twelve Members, convene a Special General Meeting of the Association. That one month's notice shall be given from the Chair of every Special General Meeting, and a printed notice sent to each Member of the Association not less than fourteen days before such meeting, and

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the object stated; and no business shall be considered at such Meeting except that for which it was specially convened.

XXII.

That the Accounts of the Association shall be made up to the 31st December in each year, and audited by two Auditors, who shall be appointed at the Ordinary Meeting following; and the Balance-sheet shall be submitted, together with a Report of the general progress of the Association during the preceding year, to an Annual General Meeting, which shall be held at such hour before the first Ordinary Meeting in February as the General Committee shall appoint.

XXIII.

That in case of a vacancy arising in any office of the Association, or in the General Committee, the General Committee have power to fill up such vacancy until the next Annual General Meeting of the Association.

XXIV.

That gentlemen of eminence in geological science, or who have done some special service to the Association, may be recommended by the General Committee for election as Honorary Members at the Annual General Meeting, and shall, upon being elected, have full privileges of membership, but that the number of Honorary Members shall not exceed twenty.

XXV.

That a copy of these Laws be delivered to each Member upon election to membership of the Association.

XXVI.

That no Law be altered, except by a majority of votes of those present at a Special General Meeting called for that purpose.

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ADDITIONS

TO

THE LIBRARY

IN 1880.

[ ] Words, etc., enclosed in square brackets do not appear on the title page of the work, but have been supplied from other sources.
* Prefixed to a work denotes that it is in progress.

ACADEMIES, *etc.*
ESSEX.
Epping Forest and County of Essex Naturalists' Field Club.
* Transactions. Pt. i, *etc.*
8vo., *Buckhurst Hill, Essex*, 1880.

BARRANDE, JOACHIM.
Du Maintien de la nomenclature, établie par M. Murchison.
8vo., *Paris*, 1880.

BUCHANAN, JOHN, *F.L.S.*
Manual of the indigenous grasses of New Zealand. *See* SURVEYS.—NEW ZEALAND.—*Colonial Museum, etc.*

CHANTRE, ERNEST.
Notice historique sur la vie et les travaux de J. J. Fournet, *etc.*
8vo., *Lyon*, 1870.

CROSSKEY, *Rev.* H. W., *F.G.S.*
Eighth report of the Committee . . . appointed for the purpose of recording the position . . . of the Erratic Blocks of England, *etc.* (*Brit. Assoc. Rept.*) 8vo. [*London*], 1880.

DAWSON, J. W., *LL.D.*, *F.R.S.*
The Chain of Life in Geological Time, *etc.* 8vo., *London* [1880].

DE LUC, J. A., *F.R.S.*
An Elementary Treatise on Geology, *etc.* 8vo., *London*, 1809.

ELIE DE BEAUMONT, *L.*
Leçons de Géologie pratique, *etc.* Tom. I.
8vo., *Paris & Strasbourg*, 1845.

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FALSAN, ALBERT.
Instruction pour l' étude du terrain erratique de la partie moyenne du bassin du Rhône, *etc.* 8vo., *Paris & Lyon*, 1869.

FOURNET, J. J.
Notice historique, *etc.* *See* CHANTRE, E.

GOSS, HERBERT, *F.L.S.*
The Geological Antiquity of Insects, *etc.* (*Entom. Monthly Mag.*) 8vo., *London*, 1880.

HAYDEN, *Dr.* F. V.
The Great West, *etc.* 8vo., *Philadelphia & Bloomington*, 1880.

HOPKINSON, JOHN, *F.G.S.*
On the recent discovery of Silurian Rocks in Hertfordshire, and their relation to the water-bearing strata of the London Basin. (*Trans. Watford Nat. Hist. Soc.*) 8vo. [*Hertford*], 1880.

HUTTON, F. W., *F.G.S.*
Manual of the New Zealand Mollusca, *etc.* *See* SURVEYS.—NEW ZEALAND.—*Colonial Museum, etc.*

JONES, *Prof.* T. RUPERT, *F.R.S.*
Note on the well lately sunk at Wokingham, Berkshire. (*Geol. Mag.*) 8vo. [*London*], 1880.
Report of the Excursion of the Geologists' Association to Camberley. (*Proc. Geol. Assoc.*) 8vo. [*Lewes*, 1880.]

KIKBY, JAMES W.
On the Zones of Marine Fossils in the Calciferous Sandstone Series of Fife. (*Quart. Jour. Geol. Soc.*) 8vo. [*London*], 1880.

LEIDY, *Prof.* JOSEPH.
Fresh-water Rhizopods of North America. *See* SURVEYS.—UNITED STATES—*U. S. Geological . . . Survey, etc.* [*Monographs.*] Vol. XII.

MARSH, *Prof.* O. C., *F.G.S.*
History and Methods of Palæontological Discovery. An address, *etc.* 4to. [——? 1879?]

PRESTWICH, *Prof.* JOSEPH, *F.R.S.*
On the origin of the Parallel Roads of Lochaber, *etc.* (*Phil. Trans.*) 4to. [*London*], 1879.

QUATREFAGES, A. DE
The Human Species. Second edition. 8vo., *London*, 1879.

SOLLAS, *Prof.* W. J., *F.G.S.*
On some Eskimos' bone implements from the east coast of Greenland. (*Journ. Anthropol. Inst.*) 8vo. [*London*], 1880.
The Sponge-fauna of Norway, *etc.* (*Ann. & Mag. of Nat. Hist.*) 8vo. [*London*], 1880.

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SURVEYS.

NEW ZEALAND.—*Colonial Museum and Geological Survey.*

*Fourteenth (Fifteenth, *etc.*) Annual Report on the Colonial Museum and Laboratory, *etc.*
8vo., *Wellington, N.Z.*, 1879 (1880, *etc.*).

Manual of the indigenous Grasses of New Zealand. By John Buchanan. 8vo., *Wellington, N.Z.*, 1880.

Manual of the New Zealand Mollusca . . . by F. W. Hutton.
8vo., *Wellington*, 1880.

[List of specimens exhibited at the International Exhibition, Sydney, 1879.] *See* SYDNEY, *New South Wales.* New Zealand Court, *etc.*

UNITED STATES.—*U.S. Geological and Geographical Survey of the Territories.*

[*Annual Reports.*]

Eleventh annual report . . . embracing Idaho and Wyoning, being a report . . . for the year 1877.
8vo., *Washington*, 1879.

[*Monographs.*]

Vol. VIII. Illustrations of Cretaceous and Tertiary Plants of the Western Territories of the United States. [Plates only.] 4to., *Washington*, 1878.

Vol. XII. Fresh-water Rhizopods of North America. By J. Leidy. 4to., *Washington*, 1879.

[*Various works*].

Preliminary Report of the Field Work . . . for the season of 1878. 8vo., *Washington*, 1878.

SYDNEY.—*New South Wales.*

New Zealand Court. International Exhibition, S., 1879. Appendix to official Catalogue [containing a list of the specimens exhibited by the New Zealand Geological Survey]. 8vo., *Wellington, N.Z.*, 1880.

USSHER, W. A. E., *F.G.S.*

The Post-Tertiary Geology of Cornwall.
8vo. [*Hertford*], 1879.

WALMISLEY, ARTHUR T.

The Bridges over the Thames at London. 8vo., *London*, 1880.

YELLOWSTONE PARK, *United States.*

The New West.—Yellowstone Park Edition.
fol., *Omaha, Nebraska*, 1880.

Corrigendum in the "Catalogue of the Library (1879)."
p. 6, line 13, and p. 55, line 20, for SANDFORD read SANFORD.

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ADDENDA ET CORRIGENDA

In the "Catalogue of the Library (1879)."

Page 5, *line* 15 *from bottom, for* "Malcostracous" *read* "Malacostracous."

Page 7, *line* 3 *from bottom, for* "SHARP" *read* "SHARPE."

Page 9, *lines* 4 & 5 *from top, for* "Vol. v.," &c., *read* "Vol. i.-iv.; Vol. v., pts. 2-6; Vol. vi., *etc.*"

Page 9, *line* 6, *for* "1868" *read* "1858."

Page 10, *line* 26 *from top, for* "EGGLESTON" *read* "EGLESTON."

Page 32, *line* 17 *from bottom, for* "observation" *read* "observations."

Page 32, *line* 15 *from bottom, for* "[*Hertford*]" *read* "[*Watford*]."

Page 41, cancel the three last lines.

Page 43, *line* 24 *from top, for* "MARCON" *read* "MARCOU."

Page 56, *line* 14 *from top, for* "SHARP" *read* "SHARPE."

Page 63, *line* 16 *from bottom, for* "*Geological Survey*" *read* "*Colonial Museum & Geological Survey.*"

Page 67, *line* 21 *from bottom, for* "TAYLOR" *read* "TYLOR."

Page 74, *line* 3 *from bottom,* dele "*M.D.*"

Page 74, *bottom line, for* "*Glasgow Geological Society,*" *read* "*Geological Society of Glasgow.*"

The following Works should have been marked (*), as in progress :—

Page 3, *Geological Society of Glasgow* *Transactions.

Page 3, *Natural History Society of Glasgow* *Proceedings.

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ADDITIONS

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The Catalogue of the Library may be had from the Secretary, Price 1s.

Bristol Naturalists' Society.

List of Members . . . 1879. 8*vo.* [*Bristol*, 1879].

CORNWALL.

Miners' Association of Cornwall and Devonshire.

Annual meeting . . . 1869. 8*vo.*, *Truro*, 1869.

LONDON.

Geologists' Association.

Association Géologique du Londres.—Excursion dans le Boulonnais au 5 août. du 10 août. (*Bull. Sci. du Dept. du Nord.*) 8*vo.*, *Lille*, 1878.

Excursion de la Geologists' Association de Londres, dans le Boulonnais. (*Ann. Soc. Géol. du Nord.*) 8*vo.* [*Lille*, 1879?]

Palæontographical Society.

GARNDER, J. S., and ETTINGSHAUSEN, *Baron* C.

*A monograph of the British Eocene Flora. 4*to.*, *London*, 1879, *etc.*

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ADDITIONS

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1879.

Club.

Appendix.

Mosses of the north-east of Ireland,
WART . . . and a list of the Creta-
oa of the North of Ireland, by J.
8vo., *Belfast*, 1875.

ninifera of Down and Antrim, by J.
—Correlation of the Silurian Rocks
y Down, by W. SWANSTON . . . and
lites of County Down) by C. LAP-
8vo. [*Belfast*], 1878.

ty.

1879. 8vo. [*Bristol*, 1879].

CORNWALL.

Miners' Association of Cornwall and Devonshire.

Annual meeting . . . 1869. 8vo., *Truro*, 1869.

LONDON.

Geologists' Association.

Association Géologique du Londres.—Excursion dans le Boulonnais au 5 août. du 10 août. (*Bull. Sci. du Dept. du Nord.*) 8vo., *Lille*, 1878.

Excursion de la Geologists' Association de Londres, dans le Boulonnais. (*Ann. Soc. Géol. du Nord.*) 8vo. [*Lille*, 1879?]

Palæontographical Society.

GARNDER, J. S., and ETTINGSHAUSEN, *Baron* C.

*A monograph of the British Eocene Flora.
4to., *London*, 1879, *etc.*

The Catalogue of the Library may be had from the Secretary. Price 1s.

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ACADEMIES, *etc.*

LONDON.

Palæontographical Society.

WOOD, Searles V.

Second supplement to the monograph of the Crag Mollusca, *etc.* 4*to.*, *London*, 1879.

MERTHYR-TYDFIL.

South Wales Institute of Engineers.

List of Members . . . 1879. 8*vo.*, *London*, 1879.

WASHINGTON, U.S.

Smithsonian Institution.

Smithsonian Miscellaneous Collection, 301. List of the publications of the Smithsonian Institution. 8*vo.*, *Washington*, 1877.

ASTRAND, J. J.

Geodætisk Bestemmelse af Bergene Observatoriums geografiske Beliggenhed. (*Christ. Vidensk.-Selsk.*) 8*vo.*, *Christiania*, 1874.

ATTWOOD, GEORGE, *F.G.S.*

A contribution to South-American geology . . . With an appendix by . . . *Prof.* T. G. BONNEY. (*Quart. Journ. Geol. Soc.*) 8*vo.* [*London*,] 1879.

BARRANDE, JOACHIM.

Brachiopodes, *etc.* 8*vo.*, *Prague & Paris*, 1879.

BARRETT, LUCAS, *F.G.S.*

On two species of Echinodermata new to the fauna of Great Britain. (*Ann. & Mag. Nat. Hist.*) 8*vo.* [*London*,] 1857.

Results of dredging researches on the coast of Norway, *etc.* (Appendix III. Description of the Echinodermata, by L. B., *etc.* *See* MACANDREW, R., and BARRETT, L.

BARROIS, *Dr.* CHARLES.

Le Marbre griotte des Pyrénées. (*Ann. Soc. Geol. du Nord.*) 8*vo.* [*Lille*,] 1879.

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Results of dredging researches on the coast of Norway, *etc.* (Appendix IV. Description of the Foraminifera, by W. K. Parker and T. R. J.) *See* MACANDREW, R., and BARRETT, L.

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Results of dredging researches on the coast of Norway, *etc.* (Appendix IV. Description of the Foraminifera, by W. K. P. and J. R. Jones.) *See* MACANDREW, R. and BARRETT, L.

PENNING, W. HENRY, *F.G.S.*
The Geology of the N.W. part of Essex, *etc.* *See* SURVEYS.—GREAT BRITAIN AND IRELAND. — *Geological Survey.* Memoirs, *etc.* [*Memoirs illustrating sheets of the Geological Survey Map of England.*] Sheet 47.

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SALTER, J. W., *F.G.S.*

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A list of the Mosses of North-East of Ireland. *See* ACADEMIES, *etc.*—BELFAST.—*Belfast Nataralists' Field Club.* Annual Report . . . Appendix III.

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[*Memoirs illustrating sheets of the Geological Survey Map of England.*]

Sheet 47. The Geology of the N.W, part of Essex and the N.E. part of Herts . . . By W. Whitaker, W. H. Penning, W. H. Dalton, and F. J. Bennett. 8vo., *London*, 1878.

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TATE, RALPH, *F.G.S.*

A list of the Irish Liassic Fossils, *etc.* *See* ACADEMIES, *etc.*—BELFAST.—*Belfast Naturalists' Field Club.* Annual Report . . . Appendix I.

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WOOD, SEARLES V., *the Elder*, *F.G.S.*

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A memoir of S. W. *See* WOODWARD, H. B.

WRIGHT, JOSEPH, *F.G.S.*

A list of the Cretaceous Microzoa of the North of Ireland. *See* ACADEMIES, *etc.*—BELFAST.—*Belfast Naturalists' Field Club.* Annual Report . . . Appendix III.

A list of the Irish Liassic Foraminifera. *See* ACADEMIES, *etc.*—BELFAST.—*Belfast Naturalists' Field Club.* Annual Report . . . Appendix II.

Recent Foraminifera of Down and Antrim. *See* ACADEMIES, *etc.*—BELFAST.—*Belfast Naturalists' Field Club.* Annual Report . . . Appendix IV.

MAPS.

IRELAND

Geological Map of Ireland . . . by Sir R. Griffith. [Scale, 1in = 4 m.] 1838.

PHOTOGRAPHS, &c.

[Eight large views of rocks and sections in the Mount Sorrel Granite Quarries and in Charnwood Forest.]

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ANNUAL REPORT

OF THE

GEOLOGISTS' ASSOCIATION

FOR

1882,

TOGETHER WITH

LIST OF MEMBERS,

LAWS OF THE ASSOCIATION, &c.

LONDON:
UNIVERSITY COLLEGE.

FEBRUARY, 1883.

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REPORT

OF THE

GENERAL COMMITTEE

FOR THE YEAR 1882.

The Census of the Association on December 31st, 1882, was as follows:—

Honorary Members	15
Ordinary Members—	
a Life Members (Compounded)	93
b Old Country Members (5s. Annual Subscription)	17
c Other Members (10s. Annual Subscription) ...	369
Total	494

During the two past years a total of 100 new Members have been elected, viz., 54 during 1881 and 46 during 1882. The small actual increase shown by the census last year as compared with the previous one being due to the fact that many names have been removed of Members who for years have neither paid their subscriptions nor received the publications of the Association, and who had, in fact, virtually ceased to be Members.

Four Members have died during the past year, viz., Mr. Moggridge, Mr. Flower, Mr. Curtis, and Mr. Tawney.

In Mr. E. B. Tawney, M.A., F.G.S., of the Woodwardian Museum, at Cambridge, who has recently died at Mentone, Geological Science has lost a zealous student who has done good work, and though but for a short time Member of this Association, we have to regret the loss of one who was ready to place his time and extensive knowledge at our disposal, as he did when Director of the excursion to the Isle of Wight; indeed, it was his appreciation of our work in the field as seen by him on that occasion which led him to join us, as it has led many another.

Mr. Matthew Moggridge, F.G.S., was one of the earliest Members of the Association, and although he devoted himself more to botany than geology, he was a very frequent attendant at the ex-

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cursions, and will be greatly missed by the many Members who were acquainted with his wide scientific knowledge and amiable disposition.

Your Committee have pleasure in presenting their financial statement which shows a considerable increase in the income of the Association. This is partly due to the continuous increase of Members and partly to an unusually large number of arrears having been paid. The amount received from Life Compositions having been £42, your Committee recommend that a sum of £50 be again invested in Consols.

Three out of four numbers of the latter part of Vol. vii. of the "Proceedings" have been published, and the fourth is nearly ready. Your President has been a very large contributor to this volume.

Your library, which is ever increasing, both by donations and purchases, continues to be extensively used. There are at present many pamphlets which it is important to bind in order that they may be in a condition to circulate among Members. Your thanks are due to Mr. Frank Rowbotham for assistance given to the Librarian at the evening meetings.

The following is a list of the Museums and Geological Collections visited during the past year :—

British Museum, Cromwell Road,

1st. On March 11th, when L. Fletcher, Esq., M.A., F.G.S., gave a demonstration on the very fine Collection of Meteorites in the Museum.

2nd. On March 25th, when Wm. Carruthers, Esq., F R.S., F.G.S., &c., gave a demonstration on the Botanical Collections in the Museum.

3rd. On April 15th, when Prof. Owen, C.B., LL.D., F.R.S., &c., Superintendent of the Natural History Department, gave a demonstration on the Mammalian Fossils of South Africa and Australia.

Corfe Castle Museum, when the members who took part in the Excursion to the Isle of Purbeck had an opportunity, under the guidance of the Rev. Owen L. Mansel, of inspecting the collection of local fossils therein contained.

The following is a list of the Excursions, with the names of the Directors and the principal Formations of each locality :—

LOCALITY.	DIRECTORS.	PRINCIPAL FORMATIONS.
Battle and Hastings.	Wm. Topley, Esq., F.G.S., of the Geological Survey, and J. E. H. Peyton, Esq., F G.S.	Tunbridge Wells Sand, Wadhurst Clay, Ashdown Sand, Fairlight Clay, Purbeck Beds.

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LOCALITY.	DIRECTORS.	PRINCIPAL FORMATIONS.
Redhill, Crawley and Three Bridges.	J. Logan Lobley, Esq., F.G.S., &c.	Folkstone Beds, Atherfield Clay, Weald Clay.
Tilgate Forest, Cuckfield and Haywards Heath.	J. Logan Lobley, Esq., F.G.S., &c.	Grinstead Clay, Tunbridge Wells Sands.
Isle of Purbeck.	The President and Prof. J. Morris, M.A., F.G.S., &c.	Bagshots, Lower Eocene Chalk, Upper Greensand, Gault, Punfield Formation, Wealden, Up. Mid. and Lower Purbecks, Portland Stone, Portland Sand, and Kimmeridge Clay.
Hayward's Heath and Ditchling Beacon.	J. Logan Lobley, Esq., F.G.S., &c.	Upper Chalk, Grey Chalk Folkestone Beds, Weald Clay, Cuckfield Clay.
Rickmansworth.	Wm. Whitaker, Esq., B.A., F.G.S., of the Geological Survey, and J. Hopkinson, Esq., F.G.S., F.L.S., &c.	Post Tertiaries consisting of Glacial and other Gravels London Clay, Woolwich and Reading Beds, Chalk.
Bexley.	F. C. J. Spurrell, Esq., F.G.S., and T. V. Holmes, Esq., F.G.S.	Dartford Heath Gravel, Thanet Sands, Chalk.
Croydon.	Prof. J. Morris, M.A., F.G.S., &c., and H. M. Klaassen, Esq., F.G.S.	Woolwich and Reading Beds, Thanet Sands, Chalk.
West Riding.	The President and J. W. Davis, Esq., F.G.S., &c.	Boulders, Middle Permian Marls, Magnesian Limestone, Millstone Grit (Third Grit and Kinder Grit), Yoredale Rocks, Carboniferous Limestone, Silurians.

The thanks of the Association are especially due to the following for assistance and hospitality at the Excursions:—His Grace the Duke of Cleveland, at Battle Abbey; Rev. Owen L. Mansel, of Church Knowle; Mr. Walter Morrison; Mr. F. C. J. Spurrell, F.G.S.; Dr. Brett; Mr. George Trossel; Mr. John Nix, of Tilgate; Major Sergison, of Cuckfield; Mr. Johnson, of Keymer, and the following residents at Harrogate, viz.: Dr. Oliver, Mr. Richard Carter, F.G.S., and Messrs Harry and Myles.

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The following is a list of the Papers read at the evening meetings :—

On Lakes and their Origin, by Prof. P. MARTIN DUNCAN, M.B. Lond., F.R.S., F.G.S., &c.

Submarine Tunnels now in progress in England, and their Geological aspect, by CHAS. E. DE RANCE, Esq., Assoc. Inst. C.E., F.G.S., of the Geological Survey.

On the Severn Tunnel Section, by EVANS JONES, Esq.

On the Geographical Distribution of Corals, by G. O. RIDLEY, Esq., of the British Museum.

On a New Section in the Thames Valley, by J. LOGAN LOBLEY, Esq., F.G.S., &c.

On a New Section at Croydon, by Prof. J. MORRIS, M.A., F.G.S., &c.

On the Long Excursion, by the PRESIDENT.

On the Geology of Cumberland, North of the Lake District, by T. V. HOLMES, Esq., F.G.S.

On the Geology of Palestine, PRESIDENT'S Address.

On the Entomostraca of the so-called Cypris Bed of Boulogne, by Prof. T. RUPERT JONES, F.R.S., F.G.S., &c.

On the New Sections in Westcombe Park, Greenwich, by T. V. HOLMES, Esq., F.G.S.

The usual term of office having expired, Mr. W. H. Hudleston retires from the Chair.

Of the many Presidents to whom the Association is deeply indebted for the zeal and ability with which they have carried out its aims in advancing the science of geology, in the lecture-room and in the field, Mr. Hudleston will ever hold a foremost place. Never once absent from the chair, either at the Committee or the ordinary evening meetings, both the details of business have been well attended to, and the interest of the meetings fully sustained. During his term of office many admirable papers have been read, his own two addresses in particular, which have been highly appreciated, not only by ourselves, but beyond the limits of this Association. The Excursions he has directed to the Vale of Wardour and the Lake District, to the Isle of Purbeck and the West Riding, will long be remembered by the many members who took part in them, both on account of the interest and picturesqueness attaching to the geological and physical features of the localities and the clearness with which these were demonstrated.

Your Committee have much pleasure in recommending Dr. Hicks as the future President.

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Dr. Hicks has for many years past taken a lively interest in the affairs of the Association, an interest evinced by his frequent attendance on your Committees, and by the many and valuable papers he has contributed to your Proceedings. Your Committee feel sure that the Association will continue to prosper under the leadership of one so experienced and able as a geologist, and so conversant with the affairs of the Association.

It is with much regret that your Committee have to announce the retirement of Prof. Blake from the post of Editor. The claims upon that gentleman's valuable time have of late become so pressing that he has found it impossible to continue the work. During his two years of office Prof. Blake has fully maintained the standard already achieved for the Proceedings by his predecessor; whilst his extensive geological knowledge rendered his services in this department of the utmost value to the Association, and by no means easy to replace.

Your Committee trust, however, that, in nominating Professor Boulger as the future Editor, they afford the Association an opportunity for securing the services of one well accustomed to scientific and literary work.

Your thanks are still due to the Council of University College for the continuance of their liberality in allowing us the use of their library for our monthly meetings.

Your thanks are also due to the Quekett Microscopical Club for continuing to allow us the use of their lamps at our annual meetings.

The Report of the General Committee was unanimously adopted as the Annual Report of the Association for the year 1882.

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GEOLOGISTS' ASSOCIATION.

Balance Sheet for the Year ending December 31st, 1882.

Dr.

		£ s. d.
To Balance, January 1st, 1882		92 19 10
„ Life Compositions		42 0 0
„ Admission Fees	£23 10 0	
„ Annual Subscriptions	£153 0 0	
		176 10 0
„ January Dividends on £399 10s. 3d. Consols	£5 17 4	
„ July Dividends on £448 11s. 9d. Consols...	£6 11 10	
		12 9 2
„ Sale of Publications		3 0 7
		£326 19 7

Cr.

	£ s. d.
By Printing and Illustrating "Proceedings"...	53 15 3
„ Miscellaneous Printing...	32 10 11
„ Posting and Addressing	28 17 9
„ Library	3 15 1
„ Fire Insurance on Stock of Publications ...	1 17 6
„ Stationery	1 14 6
„ Attendance and Sundries	7 4 5
„ Purchase of Consols	50 0 0
Balance	147 4 2
	£326 19 7

We this day having examined the Accounts of the Geologists' Association, find the above Statement to be correct, and that a balance of £147 4s. 2d. remains in the hands of the Treasurer.

(Signed), THOMAS DAVIES, T. V. HOLMES, } Auditors.

January 30th, 1883.

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General Committee and Officers,

Elected at the Annual General Meeting of the Association, held at University College, February 2nd, 1883.

President.

Henry Hicks, Esq., M.D., M.R.C.S., F.G.S.

Vice-Presidents.

J. Hopkinson, Esq., F.G.S., F.L.S., &c.
W. H. Hudleston, Esq., M.A., F.G.S., F.C.S.
Prof. T. Rupert Jones, F.R.S., F.G.S., &c.
Prof. John Morris, M.A., F.G.S., &c.

Treasurer.

J. Logan Lobley, Esq., F.G.S., F.R.G.S., &c.

Secretary.

John Foulerton, Esq., M.D., F.G.S.

Editor.

G. S. Boulger, Esq., F.L.S., F.G.S.

Librarian.

Ed. Litchfield, Esq.

John Bradford, Esq.
Wm. Carruthers, Esq., F.R.S., F.G.S., F.L.S.
J. Drew, Esq., M.D., F.G.S.
W. Fawcett, Esq., B.Sc.
T. V. Holmes, Esq., F.G.S.
H. M. Klaassen, Esq., F.G.S.
A. C. Maybury, Esq., D.Sc.Lond., F.G.S.
R. Meldola, Esq., F.C.S.
J. Slade, Esq., F.G.S.
W. J. Spratling, Esq., B.Sc. Lond., F.G.S.
Dr. H. Woodward, LL.D., F.R.S., F.G.S., F.Z.S.
B. B. Woodward, Esq., F.G.S.

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LIST OF MEMBERS.

LAWS OF THE ASSOCIATION, &c.

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HONORARY MEMBERS.

Year of Election.

1862. The Rev. DAVID HONEYMAN, D.C.L., &c., Halifax, Nova Scotia.

1867. JOHN MORRIS, M.A., F.G.S., &c., Emeritus Professor of Geology and Mineralogy, University College, London, 15, Upper Gloucester Place, Dorset Square, N.W.

1870. WILLIAM CARRUTHERS, F.R.S., F.L.S., F.G.S., British Museum, South Kensington.

1870. B. WATERHOUSE HAWKINS, F.L.S., F.G.S.

1870. THOMAS RUPERT JONES, F.R.S., F.G.S., &c., Professor of Geology, Late of Staff College, Sandhurst; 10, Uverdale Road, King's Road, Chelsea.

1871. THOMAS DAVIDSON, F.R.S., F.G.S., &c., Vice-President of the Palæontographical Society, 9, Salisbury Road, West Brighton.

1872. ROBERT ETHERIDGE, F.R.S., F.R.S.E., Pres.G.S., Palæontologist to the Geological Survey of Great Britain, 28, Jermyn Street, S.W.

1873. The Rev. THOMAS WILTSHIRE, M.A., F.L.S., F.G.S., F.R.A.S., &c., 25, Granville Park, Lewisham, S.E.

1875. HENRY WOODWARD, LL.D., F.R.S., F.G.S., F.Z.S., 129, Beaufort Street, Chelsea; and British (Natural History) Museum, South Kensington.

1875. WILLIAM WHITAKER, B.A., F.G.S., H.M. Geological Survey, Museum, Jermyn Street, S.W.

1876. Sir CHARLES STRICKLAND, Bart., Hildenley Hall, Malton.

1876. The PRESIDENT OF THE GEOLOGICAL SOCIETY, Burlington House, W.

1878. RICHARD OWEN, C.B., M.D., D.C.L., LL.D., F.R.S., F.L.S., F.G.S., Assoc. Inst. de France, Superintendent of the Natural History Departments, British Museum, South Kensington; Sheen Lodge, Richmond Park, Surrey, W.

1879. Dr. F. V. HAYDEN, of the Geological and Geographical Survey of the U.S. Territories.

1880. WILLIAM HENRY FLOWER, LL.D., F.R.S., F.G S., F.L.S., Hunterian Professor of Comparative Anatomy and Conservator of the Museum, Royal College of Surgeons, Lincoln's-Inn-Fields, W.C.

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ORDINARY MEMBERS.

Names having * prefixed are those of Life Members, who have compounded for their Annual Subscriptions.

Names having † prefixed are those of Country Members elected previous to January, 1863, and who pay an Annual Subscription of Five Shillings only.

Names having ✠ prefixed are those of Members who have contributed to the Publications of the Association.

Year of Election.

1859. *Adams, William, F.G.S., &c., Park Place, Cardiff.
1873. Addy, John, Queen Street, Peterborough.
1881. Akers, G. J., The Close, Salisbury.
1882. Atkinson, Wm., 9, Bute St., South Kensington.

1878. Badcock, John, jun., Queen's Gate, 270, Victoria Park Road, E.
1859. Badcock, P., 4, Aldridge Road Villas, Westbourne Park, W.
1882. Bailey, Rev. George, 1, South Vale, Upper Norwood.
1861. Bailey, John W., 75, Broke Road, Dalston, N.E.
1871. Baldwin, Arthur Ernest, Milford Haven.
1876. *Balston, William G., Bearsted House, Bearsted, Maidstone.
1875. Barber, Mrs. William, Barrow Point, Pinner.
1882. Barham, George Titus, Danehurst, Haverstock Hill, N.W.
1875. ✠*Barrois, Charles, Dr., 185, Rue Solferino, Lille, Dept. du Nord, France.
1881. Bartlett, Richard E., 44, Anodell Road, Peckham, S.E.
1860. Bartlett, W. H., 4, Great George Street, Westminster, S.W.
1860. †Barugh, Lieut. J., Charlestown, Bridlington, Yorkshire.
1882. Baxter, Miss Helen, 37, St. Paul's Road, Camden Town, N.W.
1871. Beale, W. Phipson, F.G.S., F.C.S., 3, Victoria Street, Westminster, S.W.
1874. *Beardmore, Nathaniel St. Bernard, 30, Great George Street, Westminster, S.W.

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1870. ✠ Bedwell, Francis Alfred, MA., F.R.M.S., Fort Hall, Bridlington Quay, Yorkshire.
1871. ✠ Beesley, Thomas, F.C.S., 5, High Street, Banbury.
1877. Bell, Joseph A., 6, Mount Pleasant Villas, Crouch Hill, N.
1880. Bell, Rev. J. T., M.A., Head Master of Christ's Hospital, Hertford.
1876. Belsham, Oliver Daniel, Heybridge, Maldon.
1877. Belsham, Maurice, Simla Cottage, Barnes.
1882. Bennett, Francis James, F.G.S., Geological Survey, 28, Jermyn St., S.W.
1882. Bennett, George, 36, Pembridge Place, and 2, Whitehall Place, S.W.
1858. †Bentley, F. J., Marlborough House, Leicester.
1882. Biddell, George, 4, Chelsham Road, Clapham.
1878. *Bird, Ernest, Engham Lodge, Wood Land, Shepherds' Bush, W.
1873. Bishop, Wm. Russell, 174, St. John's St., Clerkenwell, E.C.
1875. Black, J. M., F.G.S., Science Club, 4, Savile Row, W.
1880. *Black, J. S., 4, Upper Brook Street, W.
1881. *Blackman, Charles W., 4, Highbury Grove, N.
1879. Blake, Alfred H., The Grammar School, Malvern.
1875. ✠ Blake, Prof. J. F., M.A., F.G.S., University College, Nottingham.
1877. Blake, John Hopwood, F.G.S., Assoc.M.Inst.C.E. of the Geological Survey of England and Wales, 28, Jermyn Street, S.W.
1871. Blumberg, George, Mansfield House, Clifton Gardens, Maida Vale, W.
1879. Bond, George, Birkbeck Schools, Peckham, S.E.
1871. ✠ Bonney, Rev. T. George, M.A., F.R.S., F.S.A., Sec., G.S., Goldsmid Professor of Geology and Mineralogy, University College, London, 23, Denning Road, Hampstead, N.W.
1858. ✠ Bott, Arthur, F.G.S., 1, Sunnyside Villas, Crystal Palace Road, East Dulwich.
1874. ✠ Boulger, George Simonds, F.L.S., F.G.S., *Editor*, 9, Norfolk Terrace, Bayswater.
1860. †Bower, H. S., Fontmell Parva, Blandford.
1871. Bowie, Mrs. A. A. L., 43, Palace Gardens Terrace, W.
1880. Boyce, Leonard P., 35, Warrington Crescent, W.

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1883. Braby, Chas., 5, Oppidam Road, Primrose Hill, N.
1859. *Braby, Frederick, F.G.S., F.C.S., Bushey Lodge, Teddington.
1867. Bradford, John, Long Room, Custom House, E.C.
1875. Brett, Alfred T., M.D., Watford House, Herts.
1877. Briant, Arthur Bourne, 8, Lansdowne Terrace, Hampton Wick.
1879. Brongniart, Charles, F.E.S.Lond., M.S.G.France, &c., Préparateur de Zoologie et de Matière Médicale, à l'Ecole Supérieure de Pharmacie, 8, Rue Guy-de-la-Bosse, Paris.
1881. Brown, George D., M.R.C.S., F.L.S., Henley Villa, Ealing.
1881. Brown, John, President of the North Staffordshire Inst. of Mining Engineers, F.Z.S., Priory Place, 155, Bristol Road, Birmingham.
1869. Browne, Colvile, F.G.S., A.R.I.B.A., The Paddocks, Swaffham, Norfolk.
1859. Browne, Rev. T. H., F.G.S., High Wycombe, Bucks.
1875. Browne, Richard Mackley, F.G.S., Redcot, Bradbourne, Sevenoaks.
1880. Bruce, Samuel Noble, F.R.C.S., 43, Kensington Gardens Square.
1871. Buckman, Professor James, F.L.S., F.G.S., Bradford Abbas, Sherborne, Dorset.
1881. Busby, Ralph A., M.R.C.S., 12, North Parade, Bath.
1882. Busby, William, Goring Heath, Oxfordshire.
1878. Butler, G. G., B.A., 257, Brompton Road, S.W.
1881. Butler, J. Dixon, 11, Redcliffe Gardens, S.W.
1873. *Butt, Arthur N., F.R.Hist.S., London Institution, E.C.

1875. Campbell, Charles, Gas Works, Neepsend, Sheffield.
1877. Canderlier, Ernest, 131, Fenchurch St., E.C.
1876. Cheadle, Robert William, F.G.S., Christ's Hospital, E.C., and Perivale Rectory, Middlesex.
1878. Chisholm, James W., Highbury Villa, Nicholson Road, Croydon.
1881. Christopherson, Charles, Keswick, Cumberland.
1858. ✠*Clarke, Hyde, D.C.L., F.S.S., M.A.I., &c., 32, St. George's Square, S.W.
1873. Clayton, Edwy Godwin, F.C.S., 43, Tavistock Terrace, Upper Holloway, N.

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1880. Cochrane, George Powrie, 1, Tweed Terrace, Park Lane, Tottenham.
1878. Cockburn, L. Weatherley, The Mount, Totnes, S. Devon, and St. Bartholomew's Hospital, E.C.
1882. Coke, Lieut. George Almsley, R.N., Brimington Hall, Chesterfield.
1877. Cole, William Mason, F.G.S., 93, St. Helen's Street, Ipswich.
1880. Conisbee, Thomas S., F.C.S., 74, York Road, Lambeth, S.E.
1881. Cook, Richard James, Llwgnypied, near Pontypridd.
1882. Cook, Stanley, L.D.S., M.O.S., 4, Castlenau Villas, Barnes.
1869. ✠Coombs, John A., F.G.S., Gas Works, Cheltenham, Gloucestershire.
1859. Cooper, Edmund.
1871. *Corfield, Professor W. Henry, M.A., M.B., F.G.S., F.C.S., &c., Fellow of Pembroke College, Oxford, 10, Bolton Row, Mayfair, W.
1880. Cotton, H. S., 1c., Vincent Square, S.W.
1876. Cotton, J. H., B.A.Lond., 3, Church Grove, Ladywell, Lewisham, S.E.
1877. Cowen, Mrs. A., 9, Rope Walk Street, Nottingham.
1877. Cowen, Mr. G. R., 9, Rope Walk Street, Nottingham.
1876. Craven, Alfred E., 65, St. George's Road, S.W.
1865. Creswick, J. Frost, Director of Works Department, Admiralty, S.W.
1880. *Crisp, Frank, LL.B., B.A., V.P.L.S., F.G.S., &c., 5, Lansdowne Road, Notting Hill, W.
1882. Crosland, W. M., Memb.Inst.C.E., New Athenæum Club, Suffolk Street, Pall Mall, S.W.
1873. Cruikshank, George Edwin, M.A., 5, Stone Buildings, Lincoln's Inn, W.C.
1859. †Curry, John, Chapel Row, Eastgate, Darlington.

1859. †Dale, G., South Street, Chichester.
1875. Dallas, John, 21, Alma Square, Abbey Road, St. John's Wood, N.W.
1880. Daniell, Mrs. M. M., 13, Bell Street, St. Andrews.
1883. Datta, P. N., 13, Brook Villas, Hanwell, W.

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1874. ✠ Davies, D. C., F.G.S., Ebnal Lodge, Gobowen, Oswestry.
1879. *Davis, J. W., F.G.S., F.S.A., Chevinedge, Halifax, Yorkshire.
1876. Davis, William H., Walnut Tree Villa, Somerset Road Tottenham.
1877. Davison, Richard, Driffield, Yorkshire.
1877. Day, J. T., 116, Charles Street, Stepney, E.
1866. Deane, Henry, Manila, care of Messrs. Smith, Wood, and Co., 21, Water Street, Liverpool.
1869. De Blaquière, the Right Hon. Lord, R.N., F.R.G.S., Springfield, Crawley, Sussex.
1867. Dessé, Ethelred, M.D., F.C.S., &c., 43, Kensington Gardens Square, Bayswater, W.
1871. *Dewick, Rev. E. S., M.A., F.G.S., 2, Southwick Place, Hyde Park, W.
1881. Dixon, Arthur, 638, Commercial Road, E.
1873. Dixon, Rev. Robert, M.A., LL.D., F.G.S., High School, Nottingham.
1867. Doble, Edmund Mohun, 5, Mount Ararat Villas, Richmond, Surrey.
1871. Donagan, Miss, 9, Upper Avenue Road, South Hampstead, N.W.
1875. Donovan, Patrick, J.P., &c., Tralee, County Kerry.
1872. *Dovaston, John, Nursery, West Felton, R.S.O., Salop.
1881. Dover, W. Kinsey, F.G.S., Myrtle Grove, Keswick, Cumberland.
1882. Dovies, Thos., F.G.S., British Museum, Cromwell Road, S. Kensington.
1858. ✠ †Dowker, George, F.G.S., Stourmouth House, Wingham, Kent.
1882. Downes, Rev. William, B.A., F.G.S., Kentisbeare, Collumpton, Devon.
1877. Drew, Joseph, M.B.Lond., F.G.S., 4, Foxgrove Road, Beckenham, Kent.
1875. Duncan, Douglas, Advocate, 8, Castle Street, Aberdeen.
1877. Duncan, Edward, 36, Upper Park Road, and 12, Pond Street, Hampstead, N.W.
1874. ✠ Duncan, Lieut.-Col. Francis, R.A., M.A., D.C.L., LL.D., F.G.S., F.R.G.S., &c., 29, The Common, Woolwich, and Science Club, 4, Savile Row, W.

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1881. ✠ Duncan, P. Martin, M.B.Lond., F.R.S., F.G.S., Prof. of Geology in King's College, 4, St. George's Terrace, Regent's Park Road, London.

1880. Eldridge, W. H., 24, Loddiges Road, South Hackney.
1859. Elt, C. H., 41, Gibson Square, Islington, N.
1877. *Espeut, W. B., F.L.S.
1878. Eunson, John, C.E., F.G.S., F.M.S., &c., 20, St. Giles Street, Northampton.
1859. ✠ Evans, Caleb, F.G.S., 3, Downshire Hill, Hampstead, N.W.
1875. Evans, Miss E. G., 12, Montague Place, Russell Square, W.C.
1881. *Evans, John, D.C.L., LL.D., F.R.S., F.S.A., F.G.S., Nash Mills, Hemel, Hempstead.
1881. Ewen, Alfred, The Lynchet, Luton, Beds.

1881. Fagg, Edward, Clarence Lodge, Canning Road, Croydon.
1882. Faulding, Joseph, Coleorton, Broadstairs.
1879. Faulke-Watling, Chas.
1879. Faulkner, J., 20, Mornington Crescent, N.W.
1874. Faust, Miss Emily, 6, Lime Tree Villas, Bischanger Road, South Norwood, S.E.
1878. ✠ Fawcett, William, B.Sc., Botanical Department, British Museum, S. Kensington.
1873. Fisher, Henry, F.G.S., 27, Bloemfontein Avenue, Shepherd's Bush.
1879. *Fitch, Oswald, F.G.S., Woodend, Fortis Green, N.
1882. Fleck, Henry, 128A, Queen's Road, Peckham, S.E.
1873. Flight, Walter, D.Sc.Lond., F.G.S., British Museum, W.C.
1877. Floyd, Thos., F.G.S., 5, Westminster Chambers, Victoria Street, S.W.
1871. Forbes, J. E. Stuart, Science Club, 4, Savile Row, W.
1882. Forbes, Peter, 323, City Road, E.C.
1882. Forbes, Wm. Alex., B.A., F.G.S., Prosector, Zoological Society, 11, Hanover Square.
1872. ✠ *Fordham, H. George, F.G.S., Odsey, near Royston, Herts.
1880. Forman, George, 1, Upper Phillimore Place, Kensington.

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1879. Fotheringham, Rev. David, Northumberland Park, Tottenham.

1871. ✠ *Foulerton, John, M.D., F.R.C.S.E., F.G.S., *Secretary*, 44, Pembridge Villas, Bayswater, W.

1861. Fox, H. Elliott, F.Z.S., Court of Probate, Somerset House, W.C.

1878. Fox, Henry, F.G.S., Field End Lodge, Eastcote, Pinner.

1880. Fox, James, Oakley House, City Road, E.C.

1861. *Freeland, Parker William, 5, Burghley Villas, East End, Finchley, N.

1883. French, H. H., Florence Villa, Grove Road, Sutton.

1880. Gardiner, C., 34, Upper Barnsbury Street, Islington.

1877. *Gardiner, H. J., F.G.S., Hurstmead, Eltham, S.E.

1871. Gardner, Henry, Dent, F.R.G.S., 25, Northbrook Road, Lee, S.E.

1864. ✠ Gardner, John Starkie, F.G.S., Park House, St. John's Wood Park, N.W.

1871. Gaskill, Roger, B.A., North Hill, Highgate, N.

1880. *Gates, Rev. George, B.A., B.Sc., Holly House, Blackheath Hill, S.E.

1879. Gibbs, C. C., M.D., Surbiton Hill, Surrey.

1870. Gibbs, William Bolger, F.R.A.S., M.R.I., Medina Villa, Knight's Hill, Lower Norwood.

1880. Giles, Oliver, 16, Bellevue Crescent, Clifton, Bristol.

1877. Gilford, William, Beech Grove, Redhill, Surrey.

1872. Gillett, Alfred, Overleigh, Street, Somerset.

1866. *Glasier, William Richard Minter, 3, The Paragon, Blackheath, S.E.

1882. Godwin, Edward W., F.S.A., Palace Chambers, Westminster, S.W.

1873. *Gordon, William John, 23, Wakehurst Road, Wandsworth Common.

1877. ✠ Goss, Herbert, F.L.S., F.G.S., &c., The Avenue, Surbiton Hill, Surrey.

1858. †Gotto, F., The Terrace, Heath Road, Leighton Buzzard, Bedfordshire.

1883. Graves, Boydell, Beckenham, Kent.

1875. *Gray, Matthew Hamilton, Lessness Park, Abbey Wood, Kent.

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1873. Green, W. Abbott, M.R.C.Ph., F.G.S., Capel Lodge, Capel, Dorking, Surrey.
1877. *Green, Miss Hester, Scalby Hall, Scarborough.
1881. Green, R. C., 10, Oxford Gardens, Notting Hill, W.
1874. Gregory, Jas. R., 88, Charlotte Street, Fitzroy Square, W.
1883. Gregory, J. W., Clare House, Goultoy Road, Clapton.
1867. Griffith, Rev. Thomas T., M.A., Seale Rectory, Farnham, Surrey.
1874. ✠ Gunn, John, M.A., F.G.S., 25, Prince of Wales Road, Norwich.

1872. *Hall, George Berringer, F.G.S., Church St., Rochford, Essex.
1877. Hall, John Edward Marshall, Sr. D. Juan E. Marshall-Hall, Minas del Rio Tinto, Provincia de Huelva, Spain.
1871. Hall, Captain Marshall, J.P., F.G.S., F.C.S., F.R.M.S., Collonge pies Veytaux, Canton Vaud, Switzerland.
1881. Hanbury, F. J., Plough Court, Lombard Street, E.C.
1874. Harraden, Samuel, F.G.S., 32, St. John's Wood Park, N.W.
1871. *Harris, Edward, F.G.S., F.R.G.S., Longton Grove, Upper Sydenham, S.E.
1875. ✠ Harrison, Wm. Jerome, F.G.S., Fernside, Golden Hillock Road, Birmingham.
1878. *Harmer, F. W., F.G.S., Oakland House, Cringleford, West Norwich.
1881. Hart, Thomas, F.G.S., Yewbarrow, Grange-over-Sands.
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1868. Wright, Bryce McMurdo, F.R.G.S., F.R.Hist.Soc., &c., Hesket House, Guildford Street, Russell Square, W.C.

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1880. Wright, Joseph Pepper, Sunnybank Terrace, Undercliffe Lane, Bradford.

1874. Young, John T., F.G.S., 27, Frampton Park Road, South Hackney, E.

1879. Young, Keith D.

The Secretary would be greatly obliged by Members informing him at their earliest convenience of change of Residence, or of any errors in this List.

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LIST OF MEMBERS WHOSE ADDRESSES ARE UNKNOWN.

*Clement, J. H.
Cooper, Edmund.
Hughes, Dr. R. J.
Jesseman, A.
Lindhamer, Ed.
Naidley, Henry.
*Neison, F. C. P.
Ormsby, Arthur S.
Robertson, Ed. H.
Rose, Winfred.
Spon, Ernest.
Tinson, Gerald E.
Underwood, Captain.
*Watson, J. G. W.
Wetherell, J. W.
Young, K. D.

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Societies, etc., to which the "Proceedings of the Geologists' Association" are Presented.

(Those marked * send theirs in exchange.)

Advocates' Library, Edinburgh.
*Anthropological Institute of Great Britain.
*Bath Royal Literary and Scientific Institution.
*Belfast Naturalists' Field Club.
*Berwickshire Naturalists' Field Club.
Bodleian Library, Oxford.
*Brighton and Sussex Natural History Society.
*Bristol Naturalists' Society.
British Museum Library.
British Museum (Natural History).
*Cambridge Philosophical Society.
Cotteswold Naturalists' Field Club.
*Dudley Geological Society.
Edinburgh Geological Society.
Editor of "Record of Geological Literature."
Editor of "Geological Magazine."
Editor of "Nature."
Editor of "Science Gossip."
*Essex Field Club.
Geological Department Library.
*Geological Society of Glasgow.
*Geological Society of London.
*Hertfordshire Natural History Society and Field Club.
*Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne.
*Leeds Philosophical and Literary Society.
Literary and Philosophical Society of Liverpool.
*Liverpool Geological Society.
London Institution.
*Manchester Geological Society.

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*Natural History Society of Glasgow.
*Norwich Geological Society.
*Plymouth Institution and Devon and Cornwall Natural History Society.
*Quekett Microscopical Club (London).
*Royal Cornwall Polytechnic Society.
Royal Geographical Society.
*Royal Geological Society of Cornwall (Penzance).
Royal Geological Society of Ireland (Dublin).
*Royal Irish Academy (Dublin).
*Royal Institution of Cornwall.
Royal Physical Society (Edinburgh).
Royal School of Mines (London).
*Royal Society of Edinburgh.
*Smithsonian Institution (Washington, U.S.).
*Society of Arts.
*Société Géologique de France.
*Somersetshire Archæological and Natural History Society.
*South Wales Institute of Engineers.
Trinity College, Dublin.
*Tyneside Naturalists' Field Club.
*United States Geological and Geographical Survey of the Territories.
University College Library.
University Library, Cambridge.
*Warwickshire Natural History and Archæological Society.
*Winchester and Hampshire Scientific and Literary Society.
*Woolhope Naturalists' Field Club.
*Yorkshire Geological and Polytechnic Society, Leeds.
*Yorkshire Philosophical Society (York).

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LAWS
OF
THE GEOLOGISTS' ASSOCIATION.

I.

That the Society be called THE GEOLOGISTS' ASSOCIATION.

II.

That the object of the Association be to facilitate the study of Geology and its Allied Sciences by the holding of Meetings for the reading of Papers, and the delivery of Lectures, by Excursions, the formation of a Library, and the publishing of Proceedings.

III.

That the Association consist of Ordinary and Honorary Members, and that Ladies be eligible for election.

IV.

That Members have the privilege of attending the Ordinary Meetings and Excursions of the Association, and of introducing two Visitors at any such Meeting or Excursion, be entitled to the use of the Library in accordance with the Library Regulations, and to receive a copy of all publications of the Association issued during their membership.

V.

That every Candidate for admission be proposed by two or more Members, who shall sign a certificate in recommendation of such Candidate, which certificate shall set forth the name and place of residence of the Candidate.

VI.

That the Proposer whose name stands first upon the certificate have personal knowledge of the Candidate, and certify to that effect upon the certificate.

VII.

That the certificate of the Candidate be read by the Secretary at the Ordinary Meeting following the receipt of the certificate, and that the election take place at the succeeding Meeting.

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VIII.

That the method of voting for the election of Members be by ballot.

IX.

That the negative votes of one-sixth of the Members voting exclude a Candidate.

X.

That the Annual Subscription for Ordinary Members be Ten Shillings (except in the case of Country Members elected previous to January, 1863).

XI.

That Members may commute the Annual Subscription by a payment of Five Pounds Five Shillings.

XII.

That Ordinary Members pay an Admission Fee of Ten Shillings.

XIII.

That Subscriptions become due on the 1st of January in each year; in the case of a new Member, immediately after his or her election, but that Members elected during the months of November and December shall not be required to pay for the year in which they were elected.

XIV.

That no Member be entitled to any of the privileges of the Association whose Subscription shall be twelve months in arrear; and that any Member whose Annual Subscriptions are two years in arrear may be excluded from the Association by the General Committee, and when so excluded shall cease to be a Member of the Association.

XV.

That the management of the Association be vested in a President, four Vice-Presidents, a Treasurer, a Secretary, an Editor, a Librarian, and twelve other Members, who shall constitute a General Committee, to be elected annually at the Annual General Meeting by ballot; the senior Vice-President and the two Senior Members of the General Committee, who shall not have held, during the preceding year, any other office, shall not be

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eligible for re-election to their respective offices until the next Annual General Meeting.

XVI.

That the Members of the General Committee attending each meeting of such Committee sign their names in a book kept for the purpose; five Members to form a quorum.

XVII.

That the General Committee be sub-divided into such sub-committees as may be desirable, and may associate ordinary Members on any such sub-committee.

XVIII.

That for the purpose of the legal protection of the property of the Association, all the funds, books, and other property of the Association be declared to be vested in three or more Trustees, who shall be Members of the Association, to be appointed by the General Committee; but the General Committee shall have power, by the vote of a majority of its whole number, to sell or otherwise dispose of any duplicate specimens, books, or other property which it may not seem to them advisable to retain.

XIX.

That minutes be kept of the Meetings of the Association and of the General Committee, and that the minutes of each Meeting be read as the first business of the next ensuing Meeting of the same kind.

XX.

That the Ordinary Meetings of the Association be held on the first Friday in each month (except during the months of August, September, and October) at eight o'clock in the evening, but that the General Committee may alter the day of Meeting.

XXI.

The General Committee may, whenever they think fit, and they shall, upon a Requisition signed by not less than twelve Members, convene a Special General Meeting of the Association. That one month's notice shall be given from the Chair of every Special General Meeting, and a printed notice sent to each Member of the Association not less than fourteen days before such meeting, and

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the object stated; and no business shall be considered at such Meeting except that for which it was specially convened.

XXII.

That the Accounts of the Association shall be made up to the 31st December in each year, and audited by two Auditors, who shall be appointed at the Ordinary Meeting following; and the Balance-sheet shall be submitted, together with a Report of the general progress of the Association during the preceding year, to an Annual General Meeting, which shall be held at such hour before the first Ordinary Meeting in February as the General Committee shall appoint.

XXIII.

That in case of a vacancy arising in any office of the Association, or in the General Committee, the General Committee have power to fill up such vacancy until the next Annual General Meeting of the Association.

XXIV.

That gentlemen of eminence in geological science, or who have done some special service to the Association, may be recommended by the General Committee for election as Honorary Members at the Annual General Meeting, and shall, upon being elected, have full privileges of membership, but that the number of Honorary Members shall not exceed twenty.

XXV.

That a copy of these Laws be delivered to each Member upon election to membership of the Association.

XXVI.

That no Law be altered, except by a majority of votes of those present at a Special General Meeting called for that purpose.

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GEOLOGISTS' ASSOCIATION.

ORDINARY MEETINGS.

The Ordinary Meetings of the Association are held at University College, Gower Street, W.C., on the first Friday in each Month, from November to July, inclusive.

The President takes the Chair at Eight o'clock.

Two Visitors may be introduced by a Member at each Meeting.

EXCURSIONS.

The Excursions take place during the Months of April, May, June, and July. Particulars of the arrangements for each Month are duly announced to Members.

PUBLICATIONS.

(Members whose subscriptions are not in arrears are entitled to receive a copy of each Publication issued during their membership.)

The undermentioned Publications of the Association may be purchased by Members on application to the SECRETARY.

PROCEEDINGS.

	PRICE.
Each No. of Vol. I. (except No. 7, which is out of print)	0s. 6d.
Vol. II., Nos. 1, 2, 3, 4, 5, 6, 7, or 8	1s. 0d.
Vol. III., Nos. 1, 2, 3, 4, 5, 6, 7, or 8	1s. 0d.
Vol. IV., Nos. 1, 2, 3, 4, 5, 6, 7, 8, or 9	1s. 0d.
Vol. V., Nos. 1, 2, 3, 4, 5, 6, 7, or 8.....	1s. 0d.
Vol. VI., Nos. 1, 2, 3, 4, 5, 6, 7, 8, or 9	1s. 0d.
Vol. VII., Nos. 1, 2, 3, 4, 5, 6, or 7	1s. 0d.
Vol. VIII., Nos. 1, 2, or 3	1s. 0d.

SEPARATE PAPERS.

Price 1s. 0d. each.

On the Red Chalk of England, by the Rev. T. WILTSHIRE, M.A., F.G.S., &c.

Mount Vesuvius, by J. LOGAN LOBLEY, F.G.S.

On some Sections of Chalk between Croydon and Oxtead, by CALEB EVANS, F.G.S.

Catalogue of Library.

The Gault, by F. G. H. PRICE, F.G.S.

Price 6d. each.

On some Peculiar Markings on the Broken Surfaces of Flints, by N. T. WETHERELL, M.R.C.S.

On the Geological Relations of the Alpine Flora of Great Britain, by the Rev. JAMES CROMBIE, M.A., F.G.S.

On the Lower Greensand of Godalming, by C. J. A. MEYER, F.G.S.

President's Address for 1873.

LIBRARY.

The Library of the Association is open for the exchange of Books on the Evenings of the Ordinary Meetings, at 7.30 p.m.

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ANNUAL REPORT

OF THE

GEOLOGISTS' ASSOCIATION

FOR

1883.

TOGETHER WITH

LIST OF MEMBERS,

LAWS OF THE ASSOCIATION, &c.

LONDON:
UNIVERSITY COLLEGE.

FEBRUARY, 1884.

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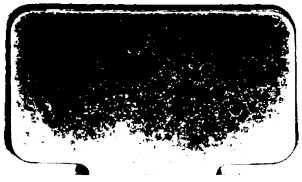

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